



Wide World Photo

Welcome Home!

Former hostage Steve Kirtley of Little Rock, Ark., waves a small American flag while George A. Persinger of Seaford, Del., looks on from the balcony of the Wiesbaden Military Hospital in West Germany last Wednesday. Their release from Teheran came after several major U.S. banks moved billions of dollars through a computer-driven funds transfer network to a Bank of England escrow account in London.

The banks involved generally observed a Treasury Department request that the details of the electronic funds transfer (EFT) be kept secret as the 52 returned hostages began a "decompression" period last week.

Former President Jimmy Carter had ordered U.S. banks to freeze Iranian assets pending resolution of the crisis. Spokesmen for the banks that transacted the EFT via a Federal Reserve System transatlantic link refused to specify the exact amount wired, but informed estimates put the figure at roughly \$8 billion. That money will be held in the escrow account and applied against Iran's bank loans and other financial claims against the country.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Framingham, Mass., and additional mailing offices ©1981 by CW Communications, Inc.

Vol. XV, No. 4

January 26, 1981

\$1.25 a copy; \$36/year

DP Staffers Remain Tops In Demand

By Ann Dooley

CW Staff

PHILADELPHIA — The computer industry remains the land of opportunity for job seekers, as computer experts were rated the most sought-after employees in the U.S. again this year.

According to a nationwide survey of new hires conducted by Fox-Morris Personnel Consultants in conjunction with National Personnel Consultants, Inc., computer professionals were named as the employees most in demand for the fourth year in a row. Corresponding information from two other recruitment firms also shows a continuing demand for high-tech personnel — especially executives — in 1981.

(Continued on Page 6)

IBM Boosts Series/1 DDP

By Tim Scannell

CW Staff

ATLANTA — IBM last week strengthened its small-computer thrust into distributed data processing (DDP) by announcing a number of hardware and software communications network enhancements for its Series/1 mini-computer.

In basic terms, the system additions consist of two processors — one that doubles the previous memory of the

(Continued on Page 4)



Wide World Photo

Were You Invited?

Tuesday was Inauguration Day for Ronald Reagan, but for others it was Aggravation Day when they didn't get tickets they had been promised for Inaugural events. Story on Page 2.

User Threatens Suit Over Ansi Cobol-80

By Rita Shoor

CW Staff

HARTFORD, Conn. — At least one end user here threatened a class action suit against members of the American National Standards Institute (Ansi) X3J4 committee if they support Cobol-80 as it now stands.

The proposed X3J4 standard is reportedly incompatible with the 1974 version of Cobol, and litigation is apparently a possibility if things do not change, based on a letter from J.T. Brophy of Travelers Insurance Companies to J.T. Pantaja, X3J4 chairman.

"We must go on record as being unalterably opposed to this [Cobol-80] standard because it does not provide complete upward compatibility,"

Brophy, a senior vice-president with the insurance firm, stated.

He pointed to past conversions that had been imposed on Travelers, along with other DP users, because of programming language incompatibility.

"These conversion efforts were nonproductive and resulted in a total waste of our programmer resources for extended periods of time," the letter continued.

Another conversion would probably be a major undertaking, considering the firm's more than 30,000 production program modules containing almost 40 million lines of Cobol code. "The prospect of changing these programs is in-

(Continued on Page 8)

Equipment Vendors Favor Bell Settlement, But Carriers Balking

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Independent manufacturers of on-line computer systems and intelligent terminals are willing to go along with a proposed settlement of the Justice Department's antitrust suit against AT&T, but specialized carriers are not. At least that is what knowledgeable sources said last week, several days after argument in the "antitrust trial of the century" was halted by presiding Judge Harold H. Greene. The interruption came when attorneys for both sides told the judge they had agreed on essential details of a negotiated settlement.

Judge Greene has given the attorneys until Feb. 2 to get this tentative agreement approved by AT&T's front office and by the new Reagan administration. If that deadline is met, the trial will be delayed another 30 days to allow drafting and approval of a final consent decree. If the Feb. 2 deadline is not met, the trial will resume.

However, even if the deadline is met, it will take a while to settle the case. For one thing, interested parties are entitled to comment on the terms, and at least one group — the Ad Hoc Committee for Competitive Telecommunications (ACCT), which represents the nation's specialized carriers — has already told the Justice Department that the proposed settlement does not go far enough.

(Continued on Page 6)

A Day In Court

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — What has been called the antitrust trial of the century — U.S. vs. AT&T — was halted

Additional coverage on AT&T and the antitrust settlement on Pages 10, 11 and 12.

here Jan. 16, one day after oral arguments began, when Justice Department and AT&T attorneys told presiding Judge Harold H. Greene they had agreed on "essential details" of a negotiated settlement.

Judge Greene gave the lawyers until Feb. 2 to put this agreement into writing and get it approved by AT&T's top management and the incoming Reagan administration. If that deadline is met, Justice and AT&T's attorneys will have until March 4 to produce

(Continued on Page 5)



TM reg. U.S. Pat. Off.

Editor E. Drake Lundell Jr.
Managing Editor Nancy French
News Editor Cheryl M. Gelb

Senior Editors:
 Industry Systems
 Communications Software
 Features

Senior Writer:
 Communications
 Correspondents:
 West Coast
 Washington, D.C.
 New York City

Writer/Analyst
Staff Writers

Chief Copy Editor
Copy Editors

Photography Editor
Editorial Assistants

Editorial Cartoonist
Contributors:
 Education
 Taylor Reports
 Human Connection

For Sales, Circulation and Production contacts,
 see inside back page.
 Please address all correspondence to the appropriate department at 375 Cochituate Road, Box 880, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153

OTHER EDITORIAL OFFICES:
 New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.

West Coast: 257 Lytton Avenue, Palo Alto, California 94301. Phone: (415) 328-8064.

Washington, D.C.: 821 National Press Building, 529 14th Street N.W., Washington, D.C. 20004. Phone: (202) 347-6718.

England: Steve Burton, IDG Publishing Ltd., 146 Clerkenwell Road, London EC1 Phone: 01-837-1222. Telex: 269477.

W. Germany: Eckhard Utpadel, CW Publikations, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61. Telex: 5215350.

Asia: Hitosumi Sasaki, Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 455-6101. Telex: J2424461.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: SECCO AA25468.

Brazil: Eric Hippieau, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th floor 20031 Rio de Janeiro, RJ, Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Kevin Kelleghan, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F., Phone: (905) 514-4218, (905) 514-6309.

Second-class postage paid at Framingham, Mass., and additional mailing offices PN127420. Computerworld (ISSN 0010-4841) is published weekly, except: semiweekly the third week in March and a single combined issue the last week in December and the first week in January by CW Communications Inc., 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

Copyright 1981 by CW Communications Inc. All rights reserved. Reproduction of material appearing in Computerworld and Computerworld Extra! is forbidden without written permission. Send all requests to Marion Kibbe.

\$1.25 a copy; U.S.—\$36 a year; Canada, Central & So. America—\$65 a year; Europe and Near East—\$125 a year; other foreign—\$175 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int'l., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Computerworld is indexed; write to Circulation Dept. for subscription information.

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 375 Cochituate Road, Box 880, Framingham, MA 01701.



MEDIA DATA FORM

Procedures, Not Computers, Blamed Inaugural Ticketing System Snafus

By Deborah Wise

CW Staff

WASHINGTON, D.C. — A "failure in ticketing operations" was the reason for hot tempers at some of last week's Inaugural events here, according to a spokesman in the Inaugural Committee's security department. It was the first time ticketing was handled by computer technology and text-processing techniques, but last-minute changes in procedure left many invitees without tickets.

Bowne Information Systems set up a bank of five CRT terminals and five hard-copy terminals at the Inaugural Committee headquarters at Fort McNair here that interfaced with two IBM 370/155 computers at Bowne's New York office.

The committee was supposed to handle more than 450,000 names and addresses keeping records of the invitations for the nine Inaugural balls, the pre-Inaugural gala, the candlelight dinners at the Kennedy Center and the many receptions and concerts held in Washington, D.C., last week.

According to Dick Leonard at Bowne, the committee had fears that some of the events would not be well-attended and sent out last-minute telegram invitations and issued corporate invitations in block sales.

The central computer facility was not informed of the operations and, as the responses were overwhelming, this contributed to the confusion over the issuing of the invitations.

According to a spokesman at the Inaugural Committee, some of the 175,000 tickets that were sent out were issued to the wrong people and delegations entitled to VIP treatment were not sent their invitations.

Tickets that missed mailing deadlines were supposed to be hand-delivered to a Willcall center and set up at Union

Station here, where they could be collected. Walter Gold, director of the Willcall operation, said there were major problems, but could not verify their nature. He expected a full report by the end of the month.

A volunteer at Willcall said that 10 days before the festivities began, only a quarter of the invitations had been delivered to Union Station which had two CRT terminals keeping track of the sales and issuing.

New, Small Users Warned: Beware IRS on DP Records

WOXBURN, Mass. — Smaller companies following the lead of the larger ones in switching to computerized accounting systems should make certain their systems meet the DP recordkeeping requirements of the Internal Revenue Service (IRS).

A 1980 IRS Revenue Ruling, a reaffirmation of a 1971 ruling with one glaring omission, has made it "clear that the IRS is not playing games about the need for appropriate [DP] records," according to a recent article in "Computer Law and Tax Report" (CLTR).

New and small users of computerized accounting systems should therefore strike a written accord with the IRS as to what tapes, disks and punchcards

need be kept to comply with federal tax law, CLTR said. Many such users may be unaware of the IRS ruling, unlike the larger companies.

The 1980 ruling, part of the Crude Oil Windfall Profit Tax Act, differed from the earlier ruling by omitting the following: "It is the desire of the Internal Revenue Service to provide fair and equitable treatment to all taxpayers using ADP accounting systems and to minimize undue hardships of ADP recordkeeping."

Wilson Sadely, IRS public information officer, said there is "nothing at all to imply [from the omission] except

that it is a generalized statement of IRS policies toward all tax paying entities."

CLTR said the omission could forecast a change in attitude toward a stricter enforcement of IRS rulings related to computerized accounting users. To hedge against this possibility, the CLTR suggested tax departments and accountants get proper IRS approval of DP operations.

In essence, a company with deficient DP accounting records could leave itself vulnerable to a damaging IRS audit. "In plain English, if you don't have a written agreement with the IRS, they can really blow you apart," a tax attorney here said.

The IRS first issued guidelines to DP accounting system users in 1964, rendering a more detailed version in 1971. The latter ruling specified the range of electronic records that must be kept by taxpayers. Although the statute of limitations for tax returns expires three years after the due date of the return, tax records should be kept "until they are no longer needed in figuring taxes," the IRS said.

The 1971 ruling did not, however, specify a universal code of what records need be retained by all computer accounting users. Instead, it specified a format whereby individual taxpayers and the IRS can work out an agreement as to what records need be kept.

This Week

IN DEPTH

Telidon: Canada's Experiment With Viewdata 51

NEWS

IBM Offerings Punctuated by Printer Debuts 4

System/38 Gets BSC, Productivity Aids 5

Spiraling Demand for DPers Worsens Shortage 6

Tymshare Plans to Be Among First With DTS 7

'Cars' May Give GOP Edge in Redistricting Battle 8

Packages Credited for Keeping GOP Out of Red. 9

Major Terms of Proposed Consent Decree 10

Baby Bell Spawns Fear of AT&T Service Slump 11

ComNet Hears Pros, Cons of Dismantling Bell 12

Why Doesn't Everyone Use APL? Expert Asks 13

CDC Offers Rival to IBM 3380 Disk System 14

GSA Efforts Called More Obstacle Than Help 15

Business Urged to Adopt OECD Guidelines 16

Insurance Firms Handling Privacy Abuses 17

Agreement on Pay Hike Ends Lockheed Strike 18

Papers on Software Technology Needed 20

Interstate Link Speeds Unemployment Claims 21

DPMA Workshops Set on Interpersonal Skills 23

System to Speed Processing of Traffic Violations 24

Mini Fine-Tunes Inventory for Stereo Firm 28

Applications Software Saves Firm \$3.5 Million 32

Schools Solve Custom Scheduling Problem 34

Packet Net Gives Hospital Remote Diagnosis 35

Programs Spark Youthful Interest in Computers 38

System Moves Small Hotels Into Big Leagues 43

Firm Stays Competitive With DP Budget Cut 45

Apple May Win in 'Least Expensive' Category 49

EDITORIAL

Editorial: IBM and X.21, X.25 60

Editorial: Good Enough? 60

Some Predictions the Pundits Skipped 61

New Systems Could Prove Boon for Teamwork 61

SOFTWARE & SERVICES

Communications System Spans Alaska 67

Inventory Eased for HP 1000s 68

Syntax Converter Translates Univac Cobol 69

Wang Unveils WP for 2000 Series 70

IBM 5280 Programs Target First-Time Users 71

COMMUNICATIONS

Land Developer Sells Common-Carrier Services 73

RS7000 Designed for Customized Solutions 74

Intertel Micro-Based Multiplexer Bows 75

SYSTEMS & PERIPHERALS

Firm Finds Shipment Delay Pays Off 79

Burroughs Offers Document System 80

MINIWORLD

Mini Helps Modify Children's Behavior 83

Minis, Micros Get UPS Series 84

COMPUTER INDUSTRY

Report Sounds PCM Alarm over IBM Changes 85

IBM Net Up 18%, Revenues 14% 85

Data Base Processor Not in Cincom's Future 86

Burroughs to Expand Component Operations 90

ADVERTISING INDEX



Jim Orgill, Director of Data Processing

ADR's integrated software expands productivity and progress at Wright Schuchart, Inc.

ADR's Integrated software improved DP services.

According to Jim Orgill, Director of Data Processing, "We've been on a fast track for the last year-and-a-half in improving our DP services. We've been able to accomplish with a very small systems development staff what other companies might require 30 or 40 people to achieve. We couldn't have come so far so quickly if it weren't for ADR software. We have DATACOM/DB and DC, DATADICTIONARY, DATAQUERY, ROSCOE and The LIBRARIAN and plan to add other ADR products in the near future."

ROSCOE reduced turnaround time from two days to 12 minutes.

According to Ron Higgins, Manager of Technical Services, Wright Schuchart had been experiencing two-day turnaround in testing. "A programmer would keypunch his deck, submit it to operations and wait for a printout. After we installed ROSCOE, turnaround time went down to 12 minutes."

ADR product integration made job 10 times easier.

"We brought in ROSCOE and The LIBRARIAN about a year ago," Mr. Higgins went on. "They worked so well together that when we looked into a DBMS we asked ADR to be part of that review. One of the vital reasons for choosing ADR was the fact that they build integrated products. It didn't make sense to us to get a data dictionary from one supplier and a data query from another. We wanted software designed to work together, a good example being DATADICTIONARY's integration with The LIBRARIAN. I honestly feel that ADR's integrated products made our job at least 10 times easier."

Better support from ADR than any other vendor.

"After ADR installed the initial products," Mr. Higgins continued, "everything worked fine. Then we accidentally clobbered the system. ADR could have told us it was our problem,

not theirs. Instead, they came back, re-installed the software and re-educated us. We've received better support from ADR than any vendor I've ever dealt with."

Instant information with ADR Data Base Management software.

"We're now beginning to make effective use of DATACOM/DB and DC, DATADICTIONARY and DATAQUERY," Mr. Orgill stated. "For example, when the payroll clerks want to find out what construction job one of our thousands of workers is on, they just use DATAQUERY to get the information from DB. Before they'd have had to go through stacks of old reports which could take forever."



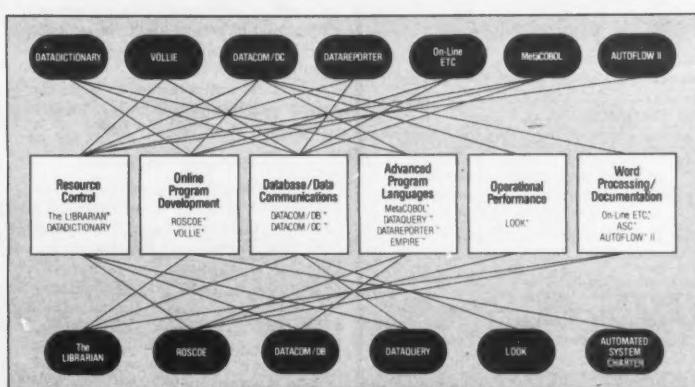
Ron Higgins, Manager of Technical Services (right) and Carl Brockman, Systems Programmer

Productivity climbing.

"Productivity is increasing tremendously," Mr. Orgill concluded. "I give the credit to my staff and to ADR products."

95-year old Wright Schuchart, Inc., is as much a Seattle landmark as the city's famous space needle, which the company built. The 50th largest U.S. contractor is a leading builder of high-rise office buildings, paper mills, and nuclear energy facilities. The company's DP department employs 21 people, operates an Intel AS4, 3330 Model 11 disk drives, has eight terminals inhouse and three at remote construction sites.

ADR. The leader in Datapro Software Awards 1977, 1978 & 1979 for IBM 370/30xx/4300 products. Over 12,000 products installed.



For more information, contact:

**APPLIED
DATA
RESEARCH**

*The Big Difference
is our integrated network*

Route 206 and Orchard Rd.
CN-8, Princeton, NJ 08540
Telephone (201) 874-9100

IBM Offerings Punctuated by Printer Debuts

ATLANTA — IBM bracketed its communications announcements last week by introducing a number of printers aimed at speeding output.

For the Series/1, IBM unveiled a family of matrix printers with a variety of printing speeds and local and remote features. The model 4975 printer offers speeds ranging from 40- to 160 char./sec. In addition, two models of

the four-model line can be switched from draft to correspondence-quality printing through Series/1 software.

The 4975 printers will be available in August at prices ranging from \$2,500 to \$3,650.

The IBM 5219 impact printer, targeted for the 5520 Administrative System is a desktop machine featuring increased flexibility in paperhandling,

typefaces and print speed, an IBM spokesman stated. The printer uses a bidirectional printwheel and offers continuous forms feeding as well as automatic, dual-drawer sheet feeding options.

The 5219 comes in two models — offering a print speed of either 40- or 60 char./sec — and a choice of 10 typefaces. The Model B01 has a purchase price of \$5,050 and a lease price of \$200/mo, while the faster Model B02 costs \$5,450 and leases for \$217/mo. Deliveries for both printers will begin in October.

Condensed Printing

Also in regard to the 5280, IBM introduced an impact matrix printer that features both a standard printing capability and a condensed printing function, with full-speed printing independent of character set size. The 5224 printer can also be used with IBM's System/34.

The 5224's condensed printing capability allows a full-size computer

printout to be printed on typewriter-page-sized paper. Up to 198 printing positions can be created to generate statistical, financial or industrial reports, the spokesman noted.

The 5224 Model 1 costs \$6,150 and can be leased for \$237/mo while the 5224 Model 2 costs \$7,000 and can be leased for \$270/mo. Deliveries are scheduled to begin in November.

IBM wrapped up its printer introductions by debuting a high-speed printer for the System/38. The 3203 Model 5 prints up to 1,200 line/min and features a power stacker. Up to two of these printers can be linked to a single System/38 processor.

The 3203 costs \$41,050, can be leased for \$1,545/mo or rented for \$1,731/mo. Deliveries of the printer are slated for March.

Finally, IBM reduced the purchase price of its previously announced 5257 impact printer from \$7,725 to \$5,450, noting that there will be no additional charges for the printer's column manipulation feature support.

IBM Boosts Memory, Communications on 5280

By Tim Scannell

CW Staff

ATLANTA — IBM's 5280 distributed data system received a communications shot-in-the-arm last week when, the firm introduced increased memory capacities and a number of additional communications features for the terminal-based 5280 system line.

The firm unwrapped new models of its 5285 and 5286 dual programmable data station and 5288 programmable control unit. The boosted memory allows up to 96K characters of information to be stored on both the 5285 and 5286. Previous models of the two machines had memory capacity of 64K.

In addition, the IBM 5288 now has memory capacities of 229,376 or 294,942 characters of information. The 5288's previous memory limit was 163,840 characters.

Features announced by IBM's General Systems Division (GSD) for the 5280 family include a communications feature that allows 5285 or 5288 terminals to appear as IBM 3270 terminals, delivering increased communications flexibility; and a second application microprocessor for the 5280, providing additional processing power.

Lease charges for the five new models of the 5285 range from \$206/mo to \$276/mo. Purchase prices range from \$6,730 to \$9,015. Deliveries for these systems are slated to begin in March.

Lease charges for the two new models of the 5286 range from \$244/mo to \$276/mo. Purchase prices range from \$8,620 to \$9,870. Deliveries also begin this March.

The 28 new 5288 models lease for prices ranging from \$284/mo to \$501/mo. Purchase prices range from \$9,855 to \$16,695. Deliveries begin in June.

IBM Upgrades Series/1 to Beef Up DDP

(Continued from Page 1)

Series/1 — a cluster-type communications controller, a communications monitor and several communications software packages.

However, from an end-user viewpoint, the recent announcements mean that up to 16 Series/1 computers can now be joined in a cluster or ring formation to exchange data and perform other processing functions.

The first processor, the 4952 Model C, is an entry-level machine outfitted with up to 128K bytes of main storage and geared to be used as a network node or stand-alone system, an IBM spokesman said. The system also features an integrated disk drive unit.

Along with the Model C, the firm introduced the 4955 Model F, which has 512K bytes of main storage, double the capacity of previous Series/1 pro-

sors. In a nutshell, additional storage on the 4955 means more active terminals on the Series/1 and the capability for system expansion, the spokesman added.

Software support for the 4955 includes Realtime Programming System Version 5, Event Driven Executive Version 3 and Control Program Support.

The 4955 will be available in April, while the 4952 Model C processor will be ready for shipment in August. Prices range from \$8,500 to \$11,550.

Communications Controller

The Series/1 local communications controller is intended for high-speed serial data communications between two or more processors and allows up to 16 computers, each with its own controller, to be attached in a ring data link. This grouping is accomplished without the need for a primary station, the spokesman said. By using the controller, the Series/1 can accommodate high-speed, memory-to-memory data transfer between two or more processors.

From a technical standpoint, the controller allows Series/1 systems to communicate using a peer-to-peer full-duplex protocol as well as access files, data or resources, the spokesman continued. Each unit is reportedly capable of directing messages to any other connected to the ring and can selectively broadcast to any or all of the units on the ring through user-written programs.

The local communications controller costs \$3,825 and will be available in August.

Communications Monitor

Still leaning on the network angle, IBM also introduced a communications monitor that is geared to manage the flow of messages between processors and devices in a Series/1-controlled network. The licensed software program is said to provide all the functions of the previous version and new device support, a high-level language interface and several other enhancements.

The monitor will be available in March and sells for a one-time charge of \$5,280.

Finally, with an eye toward continued beefing-up of the Series/1 communications software, IBM unveiled a Realtime Programming System/Systems Network Architecture (SNA) extended support option, which is said to enhance the overall usability of the Series/1's base operating system's SNA support. Briefly, the package provides the computer with a Get/Put-level interface to IMS/VIS and CICS/VIS application programs in the host.

The one-time fee for the extended support option is \$2,784 and it will be available sometime this month.

Software Updates

In addition, the firm announced a Realtime Programming System/Multiple Terminal Manager Version 2 for the Series/1, which includes IBM 3270 emulation upstream to a host system and additional terminal support, Indexed Access Method Version 2 and Cobol Version 2.

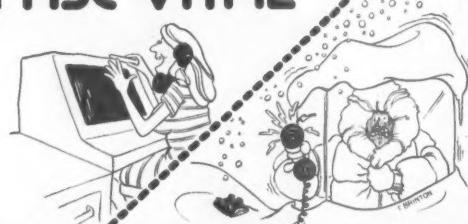
Indexed Access Method Version 2 is designed for both Series/1 operating systems — Realtime Programming System and Event Driven Executive — and supports all the functions in the previous version. The difference, however, is that the newest version has multiple index support, a data paging function and an enhanced Indexing Access Method utility function.

Cobol Version 2 is also available for both Series/1 operating systems and includes such key functions as logical connectives and blocking of relative files.

The one-time charge for a development system license for the terminal manager, available immediately, is \$15,000. The Indexed Access Method and Cobol versions 2 are priced at \$1,440 and \$4,512 for a one-time charge, respectively. Both software packages will be available this August.

Additional information on IBM's Series/1 enhancements and product announcements can be obtained from the firm's General Systems Division, P.O. Box C-1645, Atlanta, Ga. 30301.

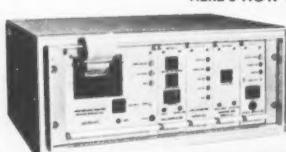
RESPONSE TIME CAN BE VITAL



"DON'T WORRY ABOUT YOUR GAS SHUT-OFF, SIR. AS SOON AS WE GET COMPUTER RESPONSE WE'LL..."

HERE'S HOW TO MEASURE IT:

We manufacture a full line of Response Time and Line Utilization equipment for data communication lines. Our portable and modular rack-mount equipment is capable of monitoring most protocols, including async, bisync and SDLC.



For further information write or call:

QUESTRONICS, INC.

3565 South West Temple Salt Lake City, Utah 84115 (801) 262-9923 TWX 910-925-4000

AVAILABLE FOR SHORT OR LONG TERM LEASING THROUGH
LEASAMETRIC INC. (800) 227-0280 CALIF (415) 574-4441

Delivery of SNA/SDLC Support Hastened System/38 Gains BSC, Productivity Aids

By Tim Scannell

CW Staff

ATLANTA — At the same time IBM announced a beefing-up of its Series/1 computer it also unveiled a Binary Synchronous Communications (BSC) support feature for the System/38 as well as additional communications hardware for the mid-range processor.

In addition, the firm released a number of software programmer productivity aids and moved the delivery date up on a previously announced communications product.

The BSC feature, which will be available for the System/38 in the first quarter of next year, will reportedly allow the computer to communicate with other System/38s, IBM computers and terminals over ordinary telephone lines. These computers and terminals include IBM's 4300 and 30 series of machines and IBM's 3741,

5230, 5280 and 5260 terminals.

The BSC leases for \$75/mo, rents for \$86/mo or can be purchased for \$2,925.

Sharing the limelight with the BSC support feature, IBM's communications attachment increases the number of communications lines on the System/38 from four to eight, to facilitate more I/O pathways, a spokesman noted. IBM also unveiled two additional workstation controllers that are said to permit up to 80 Model 5250 Information Display System devices to be directly attached to System/38, doubling the previous number.

Prices for the workstation controllers and communications attachment are

the same as those of the current products, the spokesman said. The communications attachment leases for \$22/mo, rents for \$25/mo and can be purchased for \$780. The workstation controller prices are \$135/mo for lease, \$155/mo for rent and \$5,070 for purchase.

IBM's programmer productivity aids, available in March, include enhancements to the Interactive Data Base Utilities (IDU). A new Source Entry Utility (SEU) user interface and a Data Base Logging feature that, along with a Log Recovery feature, provides a means for logging and recovering interactive data base jobs. The latter features reportedly free the user from

performing those chores.

Finally, IBM announced a System/34 to System/38 conversion aid to assist in converting application code for use on the System/38. The conversion aid will be available this September.

The one-time charge for the conversion aid is \$1,300. Monthly charge for the Interactive Data Base Utility is \$65 while the logging recovery software costs \$50/mo.

Finally, focusing on delivery dates, IBM announced that the availability of the SNA/SDLC communication support for the System/38 as a terminal to IBM 370 processors has been moved up three months from June to March 1981.

U.S. vs. AT&T: A Day in Court

(Continued from Page 1)

the full text of a tentative consent decree: They must also persuade the White House and AT&T's front office to approve it by then.

If either of these deadlines is not met, the judge added, the trial will resume immediately.

Reporting that he had met earlier with Justice Department and AT&T representatives in chambers, Judge Greene said in a five-page memorandum order that he had been advised the settlement may be "characterized as essentially complete."

By Feb. 2, Judge Greene "expects" AT&T Vice-President and General Counsel Howard J. Trienens and "the new attorney general or his designee" to file statements with the court which obligate both the government and the telephone company to "support the settlement framework as it existed on Jan. 14 with whatever changes or additions the parties may have agreed to since then."

Also, both parties must state that they believe "this framework can be transformed into a consent decree . . . within 30 days thereafter," and that "they will commit the resources necessary to effect this transformation," Judge Greene said.

The trial began in 1974 and so far has cost AT&T \$250 million, the company said. The government reportedly has spent about \$10 million.

The government asserts that AT&T — through its 23 operating companies, Long Lines Department, Western Electric and Bell Laboratories — violated Section 2 of the Sherman Antitrust Act during a 10-year period that began in 1968.

AT&T's basic defense is that whatever it did was legal under the Communications Act of 1934 and subsequent FCC rulings: That in any event, these actions were condoned by the FCC, thus immunizing the company from prosecution under the Sherman Act. AT&T also argued that divestiture, as proposed by the government, would destroy "the most advanced, efficient and successful communications system in the world."

Invest

Get the most out of your
Disk Space Dollars and enjoy greater
functional capabilities as well.

All system software from Computer Associates yields an outstanding return on investment.
CA-DYNAM/D is particularly value packed.

For instance, its sophisticated Space Allocation Algorithm dramatically reduces disk space requirements. You will avoid reruns, increase throughput, and eliminate partition dependence. CA-DYNAM/D's advanced Catalog Management Facility optimizes file security while providing comprehensive utility commands to control file attributes.

Continued enhancements, such as DOS/VSE and FBA compatibility, keep CA-DYNAM/D the most up to date system available. No wonder over 1,000 installations world-wide have chosen CA-DYNAM/D.

Simply put, CA-DYNAM/D is the best investment for DOS, DOS/VSE or DOS/VSE users who take pride in efficiency and a well-spent dollar. Send for free information today!

CA-DYNAM/D®

HEADQUARTERS

Computer Associates Building
125 Jericho Turnpike Jericho, NY 11753

Offices in the United States,
Europe, Australia, and Canada.

Distributed in 32 countries world-wide.

**MAIL THE COUPON
OR CALL TOLL-FREE**

800-645-3003

[NY State Call: (516) 333-6700]
CANADA Call: (416) 842-2110

Member Software
Industry Association

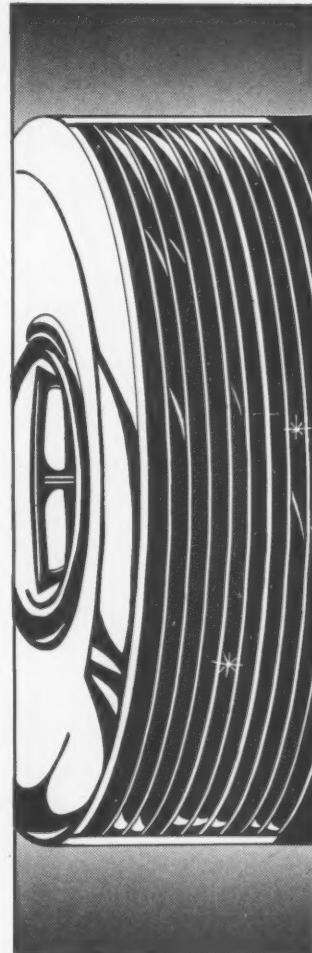
COMPUTER ASSOCIATES

125 Jericho Turnpike, Jericho, NY 11753
YES! Send FREE information on CA-DYNAM/D

Name _____	Address _____	City _____ State _____ Zip _____
Title _____	Phone _____	CPU _____ O/P/SYS _____
Company _____		
Address _____		
City _____		
State _____ Zip _____		

CW 1/26/81

- Also send info. on:
- CA-SORT High Performance Sorting
 - CA-DYNAM/T Disk Space Management
 - CA-DYNAM/FI File Independence Facility
 - CA-EARL Flexible Report Writer
 - CA-SOLVE Symbolic COBOL Debugger
 - CA-JASPER+ Job Accounting/Reporting
 - CA-DRIVER Job Management System



Computer Pros Hot Item For Fourth Year in a Row

(Continued from Page 1)

The overall demand for computer professionals will rise 25.6% above 1980 levels, according to the Fox-Morris survey in which 4,670 U.S. employers were polled. This figure indicates an increase over last year's record rise, which was listed at 18.7%, according to Fox-Morris.

Demand for Programmers

Although computer professionals at every level will be in high demand, employers will find themselves most in need of computer programmers, with 1981 new hire demand projected to escalate 35.6% above record 1980 levels, the survey showed.

Others in high demand will be software engineers, systems analysts and management-level personnel with computer knowledge, including data base managers and corporate directors. Vice-presidents, especially those with backgrounds in mainframe and distributed data processing computer combinations will also be sought by businesses around the country.

Other professionals that are in demand are financial vice-presidents, who as a group will experience an 18% rise in demand in cost-conscious 1981, and auditors, especially those experienced in the use of DP techniques.

The Fox-Morris survey indicated that the chief executive officer with a strong generalist's grasp of the entire corporate picture will continue to be in short supply. Women, too, are expected to be moving in a continued upward track to the executive level, the survey claimed.

The Fox-Morris survey — which was uniformly optimistic — found that even those without on-the-job experience will fare well over the next 12-month period. Computer science graduates have seen their salaries jump more than 40% in the last three years, according to survey statistics.

Computer programmers experienced

a 35.6% increase in demand while that for systems analysts will rise 24.1%, according to the survey. Employers' need for data base managers will rise 20.6% in 1981, respondents indicated.

Projected salaries will keep pace with occupational demand, the survey showed. Corporate management information systems directors can expect to earn \$50,000 on an average across the country, according to the survey. Systems analysts with two to five years of experience can expect to earn an average \$25,650. Employers in the survey indicated the average salary of programmers in 1981 will be \$23,500.

The survey statistics, however, may not necessarily reflect a complete overview of DP professionals because only those firms doing business with the personnel agencies were questioned.

Spiraling Demand for DPers Aggravating Shortage

NEW YORK — The need for computer experts continues to spiral in 1981, but employers — although expecting to increase their new hires — view the increased demand as aggravating an already difficult hiring situation.

These are the findings of a semiannual "Employment-Level Forecast Survey" of 301 business and industrial organizations by Deutsch, Shea & Evans (DS&E), a recruitment and consulting firm based in New York.

Of the respondents polled, only 4% predicted a drop in their current DP staff of programmers and analysts, 43% saw increases in their computer work force and 44% expected employment of this group to remain at its present level.

A substantial percentage of the responding companies expected to in-

crease college hiring in what is already a highly competitive arena for new talent, according to DS&E. Close to a third, 30%, expected to add more new graduates this year than last; 39% planned to hire the same number as last year; 15% expected to reduce campus hires; 10% said they do not hire new graduates and 5% are still undecided.

The 1981 employment predictions are more optimistic than in the last half of 1980, but strikingly resemble the forecasts for the beginning of that year, the recruitment firm said.

The recessionary economy has had little effect on the prospective high demand for computer professionals, but surprisingly, the change in administration to a business-oriented president has caused less of an impact than expected, DS&E said.

Vendors Favor Settlement, Carriers Don't

(Continued from Page 1)

Also, the settlement cannot become final until Judge Greene accepts it; before making up his mind, he may ask for additional written evidence from either or both sides and may conduct further oral hearings to obtain testimony from witnesses.

The Reagan succession creates a special problem because Judge Greene's order requires the new administration to officially endorse the proposed settlement terms by Feb. 2. Incoming Attorney General William French Smith announced during his Senate confirmation hearing that he will totally disassociate himself from the case; he was until recently a director of Pacific Telephone and Telegraph Co., one of the defendants. No deputy or associate attorneys general have been named yet, and even if they are selected within the next few days, they must be confirmed by the Senate before taking office.

One question that remains to be answered, if and when government and

AT&T lawyers hammer out a detailed settlement in writing, is whether it will be accepted by the federal district court in New Jersey that has jurisdiction over the consent decree AT&T signed in 1956 after an earlier antitrust case.

A key provision of that 1956 agreement bars the phone company, with certain minor exceptions, from offering anything but regulated communication services. Reportedly part of the current settlement would erase this provision by allowing AT&T to offer "enhanced" services on an unregulated basis through a separate subsidiary.

These enhanced services include computer-based on-line information offerings, such as store-and-forward electronic mail, and others such as Advanced Communications Service (ACS) which perform the speed, code, protocol and message-code conversion functions needed to interface different types and makes of dumb and smart

terminals. Until the Federal Communications Commission's (FCC) recent Second Computer Inquiry decision, these functions were generally regarded as DP, rather than communications. Although at least one major computer trade association has now apparently changed its mind (see story on Page 10), there is no certainty the New Jersey court will do likewise.

Assuming Judge Greene gives his blessing to the separate subsidiary idea, it will almost certainly have to be approved also by the New Jersey court. That would give opponents another opportunity to attack the scheme.

Major Factors

Two factors seem to have produced the tentative agreement: a desire by the incoming Reagan administration to get the case over with (it was begun in 1974), and AT&T's desire to hedge its possible losses.

If Bell loses the case after any witnesses take the stand, the decision — as well as those witnesses' testimony, together with related material — can be used by other plaintiffs who have filed antitrust charges against the phone company.

However, according to a former Justice Department attorney, this threat is more apparent than real, since virtually all of the material to be presented in the early stages of the trial is already in the public record: it consists of FCC decisions and material from the case MCI Communications Corp. prosecuted against AT&T and won last year in Chicago.

All of which suggests that the Reagan administration's views may be the predominant motivating force.

AT&T has appealed the MCI verdict, as well as another adverse judgment won earlier by Northeastern Telephone Co. in Bridgeport, Conn., and Bell may believe that by settling with the government now on the basis of the terms that have reportedly been negotiated, it will stand a better chance of winning these two appeals.

Money is a related consideration; in Chicago, MCI was awarded treble damages amounting to \$1.8 billion, with interest until the money is actually handed over. It is the largest antitrust damage awarded in history.

Terminals WHEN: One day shipment guaranteed!

QWIKTERM
Your single source for brand-name terminals.

BOSTON (617) 246-1865
P.O. Box 185, Lynnfield, MA 01940

CHICAGO (312) 595-7733
284 West Devon Ave., Bensenville, IL 60106

NEW YORK (212) 564-7731
2 Penn Plaza, New York, NY 10121

SAN FRANCISCO (415) 461-0923
1100 Lakeside Landing Cir., Larkspur, CA 94939

WASHINGTON, D.C. (703) 522-1210
1555 Wilson Blvd., Arlington, VA 22209

DEC

PERKIN-ELMER
551
1100
1200
1251

TI
TI-745
TI-765
TI-820

RACAL-VADIC
All Models

DIABLO
830
1640/50

LEAR SIEGLER, INC.
ADM-3A+
ADM-31
ADM-42

LA-34
LA-36
LA-120

TTY
TTY-43
TTY-43ASR

Xerox Expected to Follow Suit

Tymshare Plans to Be Among First With DTS

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Tymshare, Inc. will be among the first companies offering Digital Termination Service (DTS), a new local distribution scheme for data communications users which was established earlier this month by the Federal Communications Commission (FCC).

A high-ranking Tymshare spokesman, pointing out that his company is already a partner of Satellite Business Systems (SBS) and others in an upcoming transcontinental transmission trial that will utilize cable and microwave local loop facilities in San Francisco and New York, said the first step in exploiting the recent FCC decision would be to apply for DTS frequencies to support the trial.

He indicated Tymshare would apply as soon as possible for licenses to operate microwave local distribution facilities "in more than 30 cities."

Another early entrant is likely to be Xerox Corp., which began the FCC proceeding in 1979 by unveiling its Xerox Telecommunications Network (Xten). "You can expect an announcement from us shortly after the text of the FCC ruling is released," a Xerox spokesman said. The text is expected to be out next month.

He explained that Xerox's DTS will be conditioned by a number of questions likely to be addressed in the text, such as the number of cities a nationwide DTS carrier must serve, whether and to what extent large companies — such as Xerox and AT&T — will have to offer DTS through separate subsidiaries and whether the service can include voice as well as nonvoice applications.

An FCC source, in answer to a question from Computerworld, said Xerox will not be required to offer DTS through a separate subsidiary, but AT&T — as a result of the Second Computer Inquiry Decision — will have to do so.

Emerging Services

The DTS ruling is important because it seems likely to accelerate the development and marketing of electronic mail and message, videotex, teleconferencing and other emerging data communications services for the home and business. One existing constraint on these offerings is the low speed and poor quality of telephone company-provided analog local loops when used for transmission of digital information.

Also, deployment of DTS networks throughout the nation would threaten the last redoubt of AT&T's network monopoly: That could lead to changes in services and pricing for all telecommunications users.

The FCC ruling allocates 130 MHz of radio frequency for a Digital Electronic Message Service (Dems), which is divided basically into two parts: intercity terrestrial and/or satellite facilities, already provided for in other FCC rules, and the DTS local distribution network. The allocated frequencies are in the 10.55 to 10.68 GHz band.

One version of DTS is Xten, which consists essentially of low-power transceivers connecting users within a metropolitan area to central gateway

through which they can communicate with distant cities.

Under the FCC order, other local distribution architectures besides Xten are permissible, but all of them must employ radio frequencies between 10.55 and 10.68 GHz. Cable-based local area networks, however, could be interconnected with DTS facilities.

This may give Xerox a competitive advantage, since its Ethernet local area network has been installed in several locations and is being aggressively marketed.

Key Provisions

Other key provisions of the FCC ruling include:

- Of the total 130 MHz allocation, 70 MHz was earmarked for the links connecting subscribers to local nodes. Another 30 MHz will provide internodal links, and the remaining 30 MHz will be kept in reserve to meet future needs.

- Providers of extended DTS will receive 40 MHz of the end-link frequency allocation, while those offering limited DTS will receive the other 30 MHz.

- The former carriers must offer service in at least 30 cities, the latter in up to 30 cities. Limited Service end links will have a subdivisible 2.5 MHz bandwidth in either direction, while Extended Service links will be 5

MHz.

- Up to four Extended Service carriers and six Limited Service carriers will be licensed in each city. In the case of competing applications, Extended Service carriers will be favored.

- The FCC staff is now preparing a Notice of Proposed Rule Making which will recommend to the commission means of allocating a second frequency band — 17.7 to 19.7 GHz — for DTS.

This proceeding is intended, among other things, to provide additional transmission capacity if and when the 10.55- to 10.68 GHz band becomes loaded, a spokesman said.

THE SCHEDULER™ SAGA OF A MODERN WORKHORSE



he Scheduler.™ A modern workhorse and a proven product that fully automates the time-consuming process of scheduling your production workload. The result is unparalleled improvement in the production environment.

The Scheduler enables you to plan, organize, and control your entire workload. It eliminates manual, error-prone, time-consuming tasks that severely limit overall productivity. Data center scheduling, production control management, workload-resource simulation, on-line tracking and documentation are all readily controlled by The Scheduler—with horsepower, rather than manpower!

The Scheduler is straightforward, understandable, and simple to use. No product currently available for the IBM OS/VS environment does more to provide a standardized level of service for operations managers.

The Scheduler is the modern workhorse for progressive data centers and the latest addition to Capex's family of effective operations products. Mail the coupon or call Capex today at (602) 264-7241 for detailed information.



4125 North 14th Street • Phoenix, Arizona 85014

Tel (602) 264-7241



K 2
Capex Corporation
4125 North 14th Street • Phoenix AZ 85014
Tell me more about fully-automated production workload processing with THE SCHEDULER.

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Phone _____

Atlanta (404) 451-8415 • Boston (617) 329-6170 • Chicago (312) 986-8618 • Dallas (214) 386-0907
• Los Angeles (213) 662-5102 • New Jersey (201) 472-7000 • New York (212) 238-8840
• Philadelphia (215) 337-8050 • Phoenix (602) 264-7241 • Washington, D.C. (301) 996-3335
Other offices in Amsterdam, Dusseldorf, Munich, Paris, Lyon, London.

'Cars' May Give GOP Edge in Redistricting

By Marguerite Zientara

CW Staff

WASHINGTON, D.C. — Technological superiority, more funds and greater numbers of incumbent Republicans may combine to give the GOP the edge in the upcoming redistricting battles to be fought in the 50 state capitals this year.

While a formal, concerted effort on the part of the Democratic National Committee (DNC) to help states draw up boundaries is still "in the talking stage," according to a DNC spokesman, the Republican National Committee (RNC) has developed its own software package designed to map out districts for the states. Expected to be utilized by some states as early as next month, the Fortran-based Computer-Assisted Redistricting System (Cars) takes advantage of color graphics and digitized input to create the maps, according to Ron Charnock, director of the RNC's Computer Services Division.

States already have access to the RNC's sophisticated computer system, at an average cost of \$250- to \$300/month — about 50% cheaper than commercial prices, Charnock noted. That technology — which far surpasses the DNC's dependence on service bureaus — coupled with the 1980 census figures, is expected to provide the ammunition the party

needs to win state redistricting skirmishes.

The final census figures — also encouraging to the Republicans — mean a loss of congressional seats in urban, usually Democratic areas, where population has declined. Most of the 17 House seats in the North and Middle West that will shift to Sun Belt states will come from urban centers.

"New York will lose five, Illinois two, Ohio two, Pennsylvania two, Massachusetts one, Michigan one, New Jersey one, South Dakota one and Indiana is losing one," reported Jeff Solder, deputy treasurer of the DNC.

"Florida will pick up three, California picks up two, Texas two and Arizona, Colorado, New Mexico, Oregon, Tennessee, Utah and Washington pick up one each," he said.

Portable Software

The RNC's software, which is "highly portable," according to Charnock, could either be delivered to states for use on their own computers, or states could remotely access the committee's Digital Equipment Corp. 2060 with 512K words of main memory and 600M bytes of disk storage.

"We're tied into the Telenet network, so in the theoretical sense we're literally a local phone call away from any state party's being able to use the RNC's computer," Charnock said.

The number of states that actually take advantage of Cars will depend on the manpower resources, instead of computer resources, the RNC is willing to dedicate to redistricting, Charnock added.

"The big problem is not the computer," he noted. "The problem is developing the [state's] data bases necessary to do a good job with redistricting, and basically that boils down to marrying census geography with political geography." While the committee uses the computer to merge such data, "it still requires a lot of people time; for example, a lot of the digitization of mapping is done by individuals working with digitizers," he added.

Cash Assistance

Instead of extensive RNC manpower dedicated to redistricting, committee aid to the states may instead take the form of direct cash assistance to many states, he noted.

"It's very difficult for any one organization to support a large number of states, because all their redistricting needs occur at the same point in time," Charnock said.

For those states that do use the software, the input to the system will include three categories, he explained. The first category is the census data each state will receive, starting "sometime next month" and finishing delivery after April 1.

Such data will reveal total state population as well as breakdowns into White, Black, Hispanic, Asian and "other" categories. While some states will receive the information on a precinct-by-prefecture basis, others will

get it on a census tract basis or municipality basis, Charnock explained.

The second piece of data that goes into the system is past electoral information on a precinct-by-precinct basis, "such as the Carter-Reagan race, the Ford-Carter race or maybe a U.S. Senate race applicable to a particular state," Charnock noted.

Lastly, if the state's census information is not on a precinct-by-precinct basis, Charnock said, the software attempts to cross-reference the census tracts and political precincts. "We create a data file that marries the two so that now [the states] can do the adequate comparisons both politically and demographically," he added.

Creating Districts

Those primary data bases are then input into the Cars software, "which allows the user to create districts and understand both the political and demographic ramifications of those districts," Charnock noted.

The extremely complex rules governing redistricting — a process that follows every decennial census — were designed to guarantee, first of all, districts of fairly consistent populations within a state, Charnock explained.

In addition, districts should guarantee ease of access of all parts of the district to other parts of the district; for example, there should be no major geographic boundary within a district, he said.

Finally, states should not pack minorities into one district or split them up so there is no representation, he added. Compactness of a district is also preferable.

Sites Asked to Comment On Ansi Cobol-80 Standard

By Rita Shoot

CW Staff

How many Cobol programs in your installation use the ALTER statement? Do your shop standards require programmers to include author, installation, date written and/or date compiled in Cobol programs?

If the answer to the first question is "a lot of them" and the answer to question number two is "yes," you should be aware that these statements may disappear if the new Cobol-80 standard is adopted. Cobol-80, as currently proposed by technical committee X3J4 of the American National Standards Institute (Ansi), provides for deleting the ALTER statement, according to a report in the October 1980 issue of *Data Management*.

The previously cited statements would also be deleted from the Identification Division of a Cobol program and the standard calls for an additional 93 reserved words. However, no provision has apparently been made for upward compatibility to Cobol-80 from the 1974 version — a situation that has resulted in a strongly negative reaction from at least one very large Cobol shop (see article on Page 1).

Efforts to elicit a response to the proposed X3J4 standard from other Cobol users were largely unsuccessful possibly because, as one manager said, "we haven't been paying attention to it."

Computerworld would like to hear

what other Cobol installations have to say about the proposed version of Cobol-80. Please address replies to Rita Shoot, Senior Editor, Software and Services, CW, Box 880, Framingham, Mass. 01701.

Ansi May Face Class Action Suit

(Continued from Page 1)

comprehensible, and from a management standpoint is totally unacceptable," Brophy said.

"A massive change to a new standard would be disruptive, nonproductive and would stifle the progress of American business enterprises to improve productivity and recover the economy," he argued.

Travelers strongly recommended that the proposed Cobol-80 standard be rejected unless complete compatibility with Cobol-74 is achieved, he said. "For the X3J4 Committee to vote otherwise would be irresponsible, tantamount to dereliction and a reflection of its business immaturity."

Brophy ended the letter with an offer to cooperate with any group endorsing Travelers' position and indicated the possibility of a class action suit against individual committee members who support a Cobol-80 standard that is incompatible with Cobol-74.

Dorlen Products

Division of Electro Consultants, Inc.
7424 W. Layton Ave., Milwaukee, WI 53220
Phone 414-282-4840

Packages Cited for Keeping GOP Campaign Out of Red

By Marguerite Zientara

CW Staff

WASHINGTON, D.C. — The wealthy Republican National Committee (RNC) and Reagan-Bush Committee attributed their considerable success in financial management during the 1980 presidential campaign largely to a set of modified software packages.

Officials from the RNC's Computer Services Division began searching for an accounting package early in 1979 when the committee expanded its computer operations by purchasing a Digital Equipment Corp. 2040 computer, recalled Marcus Heth, director of systems/software for the division.

Recognizing the need for a package that was "efficient, economical and which could be used on a time-sharing basis," according to Heth, the officials "conducted a thorough investigation of the systems currently available."

That investigation resulted in choosing the accounts payable and general ledger packages offered by Timesharing Consultants, Inc. (TCI) of Tucson, Ariz. The choice was based on four basic criteria:

"First, TCI's software met the stringent audit and reporting standards required by today's political environment," Heth noted. Second, the packages were modular and could be easily modified to meet specialized needs such as a special reporting function required by the Federal Election Commission.

Third, Heth pointed out, both packages were designed on and for the Decsystem-20. Finally, the systems were easy to learn and operate, so the RNC could "quickly and efficiently" train a large number of operational and clerical personnel. "This last point was crucial because of the short, fixed time schedule placed on the RNC by the election," Heth observed.

During the election campaign, the RNC, with TCI's help, modified TCI's standard accounts payable and general ledger packages, followed by a testing period.

The RNC began its installation process in early June 1980 and in late July, after Gov. Reagan's nomination, both the RNC and the Reagan-Bush Committee were utilizing both packages, Heth said.

"Usually TCI sets its installation time for one package to be utilized by an organization at three months," Heth reported, "but in this case, the RNC and TCI were able to modify and install two packages for use by two organizations in two months. Remarkably," he added, "the system has yet to produce a major error."

The RNC utilized the software through terminals linked directly to the mainframe here, while the Reagan-Bush Committee used remote terminals and auxiliary printers placed in their offices in nearby Arlington, Va.

Check Processing

From late July to the end of the campaign accounting cycle in early December, the system produced approximately 200 checks per day, totalling around \$29 million, for the Reagan-Bush Committee, Heth said.

At the same time, it produced another 200 checks per day, totalling approximately \$30 million, for the RNC. The

system also produced daily accounts payable and general ledger reports, some containing as many as 2,000 pages.

"For all that processing, the system never output an incorrect check or an out-of-balance report," Heth claimed.

A major portion of the system's success may be attributed to the administrative guidelines and techniques provided by TCI. "These guidelines focus on the control and auditability of the data base, as well as on the ease of backup and recovery," he observed.

Based on the success of the two systems, the RNC now plans to purchase TCI's payroll package, according to Heth.

Lease, Software Prices Hiked on CDC Cybers

MINNEAPOLIS — Control Data Corp. will increase the lease price on its large-scale Cyber 700 series processors by 7% and hike the cost of major operating software and software maintenance for that line by 9.5%.

Lease prices for the Cyber 170 models 730, 740, 750 and 760 will go up 7% on March 1. Licenses for all Cyber 700 series network operating systems, selected compilers, languages and utility programs will rise 9.5% effective Feb. 1.

CDC's problem-solving support, the Central Enhancement and Maintenance Service (Cems), will also increase 9.5%, effective May 1.

Selected peripheral equipment, including 885 disk subsystem, will go up

7% to 12% effective March 1, CDC said.

Spared from the price increase was CDC's entry-level Cyber 720 processor. Purchase prices on the 700 series were unchanged, and the purchase prices were decreased by 30%, a spokesman said.

The CDC price increases come on the heels of similar increases by IBM [CW, Jan. 12]. CDC's 700 series processors are roughly equivalent to IBM's 3033 line.

Industry analysts had predicted most major vendors would follow IBM's lead in raising prices. CDC's last price increase came in May 1980, and IBM made a similar announcement in June.

ISAM VSAM

Break Out of the STONE AGE | Get Out of the DARK AGES with IAM

INNOVATION ACCESS METHOD
The Transparent Replacement for ISAM & VSAM

- IAM CICS Response Time Cut in Half
- IAM Batch Jobs Completed in Half the Time
- IAM No Program or Operating Systems Changes
...Just Change Your JCL
- IAM 50% Fewer Disk EXCP's — 25% Less CPU
- IAM Files Unaffected by Abends

Available for IBM OS, VS1, SVS and MVS. For further information or free trial call or write...

"The Makers of FDR & DSF"

INNOVATION DATA PROCESSING
970 Clifton Ave., Clifton, NJ 07013
201 — 777-1940

Major Terms of Proposed Consent Decree

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — Based on comments from a number of knowledgeable sources, these are the major terms of the proposed consent decree to which Justice Department and AT&T lawyers have agreed:

- A new company would be established, encompassing the research, development and manufacture of "competitive" products and "enhanced" services — e.g., telephones, PBXs, intelligent terminals and computer-based on-line information offerings.

"Five or six" manufacturing plants, now owned and operated by Western Electric, plus about 15% of the Bell Laboratories work force, plus Teletype Corp., which manufactures AT&T's Dataspeed 40 terminal and similar devices, would be transferred to this new company.

However, it is not clear, according to our sources, whether the new entity would be independent of AT&T or merely a separated subsidiary. In the latter case, said Jack Biddle, president of the Computer & Communications Industry Association (CCIA),

"we would be very concerned."

- Enhanced services would be marketed through a separate subsidiary, basically according to the terms laid down in the Federal Communications Commission's (FCC) recent decision in the Second Computer Inquiry. A key element of this provision is that the "separate sub" could not own transmission or switching facilities. These would be provided by the subsidiary's parent, AT&T. The terms for the subsidiary would be the same as for its competitors.

- At least one, and possibly three, AT&T operating companies would be reorganized into totally independent companies.

Pacific Telephone and Telegraph Co. is one of the reported spin-offs, while Cincinnati Bell and Southern New England Telephone and Telegraph Co. are the others. Also, AT&T's present Long Lines Division would be converted into a separate subsidiary and might take over the long-distance plant now owned by Bell's 23 operating companies.

It is this last provision that has aroused the opposition of the specialized carriers. According to a spokesman, only divestiture of AT&T's entire Long Lines operation will adequately protect the specialized carriers against cross-subsidization and other anticompetitive behavior by Bell.

The spokesman added that the reported plan to spin off the three operating companies is "meaningless," since AT&T holds only a minority interest in two of them — Cincinnati Bell and Southern New England Tel — and has been tightly controlled in California by that state's public utilities commission.

"This statement assumes that the subsidiary obtains enhanced service from an operating company on the same terms as its independent competitors."

Biddle also indicated CCIA will no longer insist AT&T is barred by its 1956 consent decree from providing enhanced services such as electronic mail, which utilize central, computerized data bases, or offerings like Advanced Communications Service (ACS), which include software to interconnect different types and makes of dumb and smart terminals.

In the long battle at the FCC which preceded the commission's computer inquiry decision, CCIA argued that the 1956 decree bars such enhanced services because it requires Bell, with certain minor exceptions, to offer only regulated services.

The association's key point was that enhanced services are primarily data processing, rather than communications, and in any event would be offered, under the FCC decision, through an unregulated separate subsidiary.

Intact®

Integrates Your Manufacturing Activities

Intact is a unique, affordable system to computerize and integrate the activities of Production, Administration, and Engineering in small to mid-size job shops using Digital PDP11 and VAX computers.

Intact increases productivity in manufacturing through computerized Job Estimating, Product Design, Order Processing, Inventory Planning and Control, Purchase Order Writing, Production Scheduling, Shop Floor Control, Job Costing, Full Financial and Word Processing.

Intact's flexibility allows you to define input to your system, the information the system stores, and reporting.

Intact is fully supported with training, easy to use computer programs, documentation, diagnostic/ corrective procedures, and telephone support.

Intact is a valuable investment now and a better investment in the future with CAD/CAM improvements.

Call or write for free brochure

COMPUTER COVENANT CORP.
790 Farmington Ave.
Farmington, CT 06032
(203) 677-5653



Terminal Reductions!

Product	List Price	Reduced Price (Quantities 1-4)
ADM 31	\$1,450	\$1,355
ADM 324	980	895
Extel AH11	1,845	1,715
GE 2030	1,495	1,475
Tally 1612 KSR	2,680	2,550
Tally 1612 RO	2,755	2,280
Teletype 43 ASR		
4330-2BCA	2,982	2,680
4330-2ACA	3,017	2,710
Teletype 43 KSR		
4320 AAK	1,558	1,420
4320 AAL	1,593	1,450
4320 AAH	1,612	1,470
4320 AAJ	1,647	1,500

Additional discounts available for quantities of 5, 15, 30 & 50.

REGIONAL SALES OFFICES:

Eastern	Central	Western
Atlanta, GA 404/447-6785	Chicago, IL 312/358-8703	Garden Grove, CA 714/534-2510
Downtown NYC 212/344-7511	Dallas, TX 214/356-1294	Los Angeles, CA 310/342-6540
Fairfield, NJ 201/575-6500	Detroit, MI 313/967-1503	San Francisco, CA 415/245-9200
Philadelphia, PA 215/337-3900	Houston, TX 713/770-0034	Seattle, WA 206/575-1607
Washington, D.C. 301/770-6220		

Carterfone
Member of the Cable and Wireless Telecommunications Group
Carterfone Communications Corporation • 1111 W. Mockingbird Lane, Suite 1400
Dallas, Texas 75247 • (214) 630-9700

FINANCIAL HEADACHES?

RSTS/E — We have your prescription!

Rx FIPS FAADS

FIPS (Financial Information Processing System)
***Interactive A/R, A/P, Payroll, G/L (w/Consolidation & O.H. Budget), built-in financial reporter & generator

FAADS (Fixed Asset Accounting & Depreciation System)
***Meets G.A.A.P., multi-company processing & depreciation methods, maintains tax AND corporate books

CRC has been writing RSTS software since 1972
The sure cure for your financial computing and reporting problems...

COMPUTER
RESOURCES



5680 South Syracuse Circle Suite 118
Englewood, CO 80111 303-771-8930

DEC and DATA GENERAL

Super Sale on PDP 11

CPU's

11/60	RP04-AA
11/45	RP03
11/34A	RK06-EA
KMC11-A	RX11-BA

PERIPHERALS

LP11-VA	CM11-FA
VT52-AA	

DISKS

RP04-AA	DL11-E
RP03	DU11-DA
RK06-EA	DZ11-A
RX11-BA	DZ11-B

DL11-E	H960-CA
DU11-DA	KE11-B

OPTIONS

TAPES	TMA11-EA
TA11-AA	

IN STOCK NOW

CALL FOR PRICE AND DELIVERY

S112HL
NEWMAN COMPUTER EXCHANGE

1250 N. Main P.O. Box 8610 Ann Arbor, MI 48107

(313) 994-3200

Member:
Computer Dealers
Association

Who Will Be Stuck Holding Baby?

Baby Bell Spawns Fear of AT&T Service Slump

By Brad Schultz

CW Staff

HOUSTON — AT&T's installed base of data communications users may face a decline in service quality from the telecommunications holding company should it give birth to a "Baby Bell" which would market DP products without regulation by the Federal Communications Commission (FCC).

That view was expressed by panelists at a recent Communication Networks '81 session here who questioned whether the FCC ruling that permits creation of an unregulated AT&T subsidiary in the DP marketplace will meet the commission's objectives of promoting competition among vendors and improving responsiveness to user needs.

The conference session did not necessarily reflect a consensus of present Bell customers, nor did the panelists claim that the long-term user impacts of the FCC ruling were obvious and inevitable, but the scenarios presented here pointed up issues likely to color plans for most of the nation's data communications in coming years.

FCC Provision

The problem with service to Bell's presently installed base lies with a provision of the FCC ruling that requires Ma Bell, the voice-oriented AT&T companies, to assume responsibility for supporting the equipment installed prior to March 1, 1982, when deregulation is supposed to take effect, according to attorney Frank Andrews III.

Conversely, the expected Baby Bell would service DP-related products installed after that date, the telecommunications lawyer for the Santa Fe, N.M., firm of Montgomery & Andrews explained.

With no new data communications business to build up, what incentive will Ma Bell have to uphold high standards of service to the installed user base? Andrews asked the conference session.

Deregulation of AT&T's DP side may be delayed for a year after the date specified by the FCC, Andrews continued, by various legal challenges and results of the federal antitrust suit against the telecommunications giant. That suit will apparently be resolved through a "negotiated settlement," or Consent Decree, but terms of the cease-fire could conflict with the FCC's specifications, which require a separate accounting mechanism for Baby Bell to prevent cross-subsidization from AT&T's lucrative voice side.

Concern Over PBX

Besides quality of service to the installed base, another issue raised by the prospect of a Baby Bell concerns AT&T's private branch exchanges (PBX), especially those known as supercontrollers, which consolidate control over the processing of words, voice and facsimile as well as data.

According to Andrews, Bell's Dimension PBX family may be construed as being enough on the DP side to fall outside FCC jurisdiction, where it could become much more expensive as part of Baby Bell's lineup — without controls the FCC normally exercises

on pricing by telecommunications carriers.

Why raise Dimension prices? AT&T may want to replace the Dimension family with the Antelope, a supercontroller Bell-watchers predict will appear in 1983 or 1984, Andrews asserted. AT&T has a tradition of driving up prices on old equipment, he explained, to force a user "rollover" to new equipment.

In pondering such matters, the user should also consider actions the FCC counterparts in state governments may take in the wake of the federal body's rulings and the Justice Department's prosecution, the New Mexico attorney observed.

Rulings and court decisions at the federal level may wind up conflicting with actions at the state level, Andrews warned.

IBMS Impact

The session panelists also questioned the user impacts of AT&T's Installed Base Migration Strategy (IBMS), an internal policy outlined in several documents that pundits, playing on the policy's acronym, sometimes call "the IBM Strategy."

Regardless of whether IBMS was written with the largest DP supplier in mind, AT&T's migration strategy is designed to minimize losses incurred by Bell companies as they encountered competition in the data communications marketplace, Andrews said, and even to deter that competition.

According to IBMS guidelines promulgated on Nov. 1, 1979, the attorney stated, 80% of AT&T-installed PBXs that accept more than 100 communications lines should be "turned over" in three years — replaced by a new "flagship" product that could be the Antelope.

IBMS also advises Bell marketing personnel to turn over 60% of the installed PBXs that accept 40 to 100 lines; 40% of installed PBXs that accept 20 to 40 lines; and 30% of AT&T's Centrexes that feature between 1,000 and 2,000 user stations.

If Baby Bell engenders such a user rollover of integrated communications

'Satellite News' Plans Seminars In Washington

WASHINGTON, D.C. — Two seminars on satellite communications will be held at the Twin Bridges Marriott Hotel here this month by *Satellite News*.

"Economics and Regulation in the Satellite Industry," scheduled for Feb. 23, will be conducted by Dr. Vladimir Naleszkiewicz, vice-president of Satellite Systems Engineering, Inc.

"Programs and Marketing Opportunities in the Satellite Industry" will be given on Feb. 24 by Don W. Flora, division director of marketing for Comsat General Corp.

Registration costs \$195 per seminar or \$350 for both. Further information is available from Lee Euler, Phillips Publishing, Inc., Suite 1200N, 315 Wisconsin Ave., Washington, D.C. 20014.

controllers, the user should at least time its acquisition of existing Bell PBXs to occur at the rollover's outset — right now — rather than a few years from now when, Andrews maintained, the unregulated price structure could be substantially higher.

Another consequence of AT&T's deregulation may be significant increases on the tariffs for private lines — the network many organizations establish by leasing lines from Bell. This trend could price many users out of the private-line market, forcing them onto the AT&T switched network, Andrews observed.

Terrifying Birth

The user representative on the conference panel, Daniel R. Grove, said he found some aspects of Baby Bell's birth "absolutely terrifying." For one thing, Baby Bell may choose to stay out of sparsely populated areas, be-

cause the organization will be driven strictly by incentive for profit and may perceive little profit potential in rural America.

For the same reason, rival data communications suppliers may also shy away from rural areas, according to the manager of telecommunications for Motorola, Inc.'s operations in the western U.S.

Grove went on to echo Andrews' concern that Ma Bell, finding its data communications market frozen at the base installed prior to the enactment of deregulation, may neglect support for the installed base, choosing instead to emphasize a more dynamic clientele on the voice side.

"The future scares the hell out of me," Grove declared, adding that, in light of the various federal regulatory actions, "the future of telecommunications will have to get worse before it gets better."



Lots of companies can deliver DEC hardware. We deliver fully integrated LSI-11 based systems tailored to your specific needs. When you need them. We configure only the best hardware and software components from DEC with a wide range of compatibles from other solid manufacturers. Systems Problems? We configure them out.

CONFIGURATION HOTLINE:
617-491-2700 / 800-343-5504

COMPUMART

Cambridge Digital Division

270 Third Street Box 564 Dept. 7502 Cambridge, MA 02139

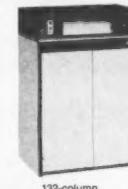
Providing Complete System Solutions since 1971.

Call or write for our DEC LSI-11 Systems Catalog TELEX 921401

BEST COST PERFORMANCE 300 LPM PRINTER ON THE MARKET!



80-column



132-column



Forms Accedit

LOCAL DATA QUIET 300™ PLUG COMPATIBLE LINE PRINTERS

- DEC®, CA, DG, Datapoint, Prime, Wang, etc.
- HP-250®, HP-300®, HP-3000® Series 30 & 33
- IBM 3780 with CRT Port
- Serial RS-232C, 20 ma, X-ON/X-OFF or Busy
- Parallel: Centronics®, Dataproducts® or DEC® LA-180
- Teletype Print Mechanism
- National Full-Service Maintenance

WEST (408) 377-7001	MIDWEST (612) 944-2097	EAST (215) 348-7493
(213) 641-1840	(414) 251-1422	(703) 241-7803
(602) 994-1280	(312) 993-2242	(305) 287-8440
	(214) 387-2855	
	(913) 288-9644	

LOCAL DATA
2701 TOLLEY ST.
TORRANCE, CA 90503
(213) 320-7126
Telex 182518 LOCALDATA TRNC

Comnet Hears Pros, Cons of Dismantling Bell

By Phil Hirsch

CW Washington Bureau
HOUSTON — Whether to dismantle the Bell System or reorganize it was the subject of an extended discussion here at the recent Communication Networks '81 (Comnet) conference.

Divestiture of AT&T — conversion of its operating companies, Western Electric and Bell Laboratories into separately funded, independently owned and managed companies — is the only way to promote competition, according to C. Gus Grant, president of Southern Pacific Communica-

tions Co. (SPCC).

He pointed out that the 40 antitrust suits now pending against AT&T indicate the company cannot be trusted to compete fairly in the newly deregulated marketplace created by the Federal Communications Commission (FCC) Second Computer Inquiry decision.

However, William W. Betteridge, an AT&T assistant vice-president, insisted that Bell "accepts the need for a competitive environment." Technology, he added, is the driving force behind modern telecommunications and only

by not breaking up the Bell system can the full power of Bell's vast technological resources be fully exploited.

The separate subsidiary structure mandated by the computer inquiry decision will prevent the company from cross-subsidizing its unregulated offerings — such as terminals and computer-based on-line information services — with revenues earned from dial-up telephone and other monopoly services, Betteridge contended.

Meanwhile, this structure will allow AT&T to "apply the full range of our technology" to developing services. Through an integrated network, he added, these new services will be offered to all.

Bell Cream-Skimming

One of Betteridge's key points was that Bell's competitors, although they harp on the evils of cross-subsidization, ignore another evil — cream-skimming. He insisted that divestiture would restrict the geographic availability of

new products and services and raise their prices, thus denying the benefits to many of today's telecommunications users.

Rep. James M. Collins (R-Texas), the ranking Republican on the House Communications Subcommittee, indicated that Congress, after failing to enact a new communications act last year, will now seek guidance from the courts.

AT&T's competitors, including several from the computer industry, have asked for judicial review of the commission's computer inquiry decision — particularly the separate subsidiary provision and the conclusion that on-line information services are "incidental" to communications and thus can be offered by AT&T without violating the company's 1956 consent decree.

Meanwhile, trial of the Justice Department's antitrust suit against AT&T is now under way. At the heart of that case is the same question Congress wrestled with last year —

how to restructure AT&T to encourage competition while promoting technology and preserving present benefits.

Substantial Progress

FCC Commissioner Anne Jones was another speaker at the Comnet session on "Legislative and Policy Framework for Telecommunications in the 1980s." Responding to criticism of the Second Computer Inquiry decision, she admitted it does not provide a final solution to the structural problem but represents substantial progress toward that goal.

The reason: To optimize competition and preserve present service benefits, it is necessary to differentiate AT&T's monopoly services from those which can safely be regulated and left to marketplace control.

As Jones put it: "It is important that such a definitional structure draw a 'bright line' between basic and enhanced services, meaning that this distinction will be unambiguous and clear to all."

PCS May Refile Against MTF

Software Theft Lawsuit Dismissed

By Marguerite Zientara

CW Staff

ATLANTA — A suit filed by Programmed Closing Systems, Inc. (PCS) against Minnesota Title Financial Corp. (MTF) charging theft of a software program [CW, Dec. 1] has been dismissed by agreement of both parties.

Because the suit was dismissed "without prejudice" — so that it may be refiled in the future — PCS' legal counsel is now attempting to gather more evidence relating to the case, according to attorney Mark Ellison of Fletcher Thompson & Associates here.

PCS, a small real estate- and mortgage-related software firm, filed the \$1.75 million suit on the grounds that MTF allegedly appropriated the software with the intent to disseminate it to "unauthorized persons" for its own profit.

The program in question is a fully automated loan processing secondary marketing, document preparation, title policy and binder preparation and loan servicing system.

"The court will take a look at some of the computer programs and possibly, hopefully, run some comparisons within the next 30 to 60 days," Ellison said.

"We just came to an agreement that we'd take a look at the two programs and run a comparison on them, hold everything in abeyance until we could find the proper experts to do that," he added.

PCS' request for an injunc-

tion to prevent MTF from continuing to use the software was denied earlier this month, MTF attorney Norman Stone of Combs, Stone & Wright in Phoenix indicated.

MTF vs. PCS Pends

While the PCS vs. MTF suit is on hold, at least temporarily, a previously filed suit by MTF against PCS in the Arizona District of the U.S. Federal Court is still pending. Stone noted.

That suit, which PCS claims was filed in an effort to get the jump on PCS' suit against MTF, asked \$142,226 against allegations that PCS misrepresented the capabilities of its software.

According to MTF's suit against PCS, PCS' software

could not accommodate 20 terminals, did not have the load capacity as represented, "consistently malfunctioned often causing a shutdown of the system" and misrouted messages to improper terminals.

In addition, the suit claimed that because of PCS' software, current data was not properly stored, and simultaneous access of similar loan files by two separate terminals caused the system to stop operating.

PCS has filed general denials of those allegations. The next step in the legal process is expected to occur "probably within the next 30 days," according to MTF lawyer Stone. He could not specify what that action might be.

MAINTENANCE

- WARRANTY
- ONSITE
- RESIDENT
- PER CALL
- CONTRACT
- PREVENTIVE
- DEPOT
- PCB REPAIR
- RECONDITIONING
- CUSTOM CABLES
- CUSTOM INTERFACING, DESIGN, MANUFACTURING

SUB MICRO'S • PERIPHERALS • ASSEMBLIES

PARTIAL LISTING OF MANUFACTURERS

ADDS	NEC
ALTOPS	NOVATION
ANDERSON JACOBSON	OMNITEC
DATA MEDIA	QUME
DIABLO	SHUGART
DIGITAL EQUIPMENT	S-100 BUSS
GENERAL DATA COMM.	TECHTRAN
HAZELTINE	TELETYPE
LEAR SIEGEL	TEXAS INSTRUMENTS
MIC	VADIC
MULTITECH	WESTERN TELEOMATIC

* QUANTITY DISCOUNTS * DEALER INQUIRIES WELCOME

NEW!
RETAIL • WHOLESALE • OFF THE SHELF DELIVERY
CABLE • CONNECTORS • SEMICONDUCTORS • ICS
SUBASSEMBLIES • PRINHEADS • ENCODERS
CHAR GENERATORS • ROMS • RAMS • SWITCHES

2M SERVICE DIV. TOLL FREE 800-526-2222
20 MONTESANO ROAD IN 201-227-8855
FAIRFIELD, N.J. 07006

THE INSTITUTE FOR CERTIFICATION OF COMPUTER PROFESSIONALS ANNOUNCES THE

CDP® ANNUAL EXAMINATION

SCHEDULED FOR MAY 2, 1981

The annual examination for the Certificate in Data Processing (CDP) will be held on May 2, 1981, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Data Processing Examination Announcement and Study Guide." The study guide and application form for the 1981 examination are available on request from ICCP

Deadline for Filing Application is March 1, 1981

Please forward the "Certificate in Data Processing Examination Announcement and Study Guide" along with application and test site list.

Name _____

Street Address _____

City _____

State or Province _____

Zip Code _____

MAIL COUPON TO: Institute for Certification of Computer Professionals Certification and Testing Section
304 East 45th Street
New York, N.Y. 10017

DEC PDT 1-Day Ship! 11/150 New Low Price!

IN STOCK 11/60, 11/55, 11/45, 11/40, 11/34,
11/20, 11/15, 11/10, 11/05

CALL (617) 437-1100

A AMERICAN USED COMPUTER
P.O. BOX 68, KENMORE STATION, BOSTON, MASSACHUSETTS 02215

Tenfold Productivity Hikes Reported

Why Doesn't Everyone Use APL? Expert Asks

By Rita Shoor
CW Staff

TORONTO — Productivity increases by a factor of 10 have been claimed for APL by some software vendors, according to Robert Metzger, branch technical manager at the U.S. headquarters of I.P. Sharp Associates, Inc.

If these claims are true, why isn't everyone using APL?

Metzger provided some answers for attendees at the 1980 APL Users Meeting here with a paper entitled "Making APL Programmers More Productive."

One reason that people don't use APL is simple historical inertia, he maintained. "People will do tomorrow what they did today because that's what they did yesterday."

Another reason "rarely ad-

mitted" is that APL programmers themselves are often not as productive as they could be, he said. This is due to a variety of pitfalls including inadequate training, isolation from other APL programmers, inefficient implementations, incorrect methods, lack of programming standards and inadequate tools.

Amateur Users

A large number of APL users are amateur rather than professional programmers, Metzger explained. They write programs for themselves rather than for other people and this leads to what he called the "fallacy of the five-day class."

This teaches that since a person without any computer background can be taught to

write APL programs in one week, that same person can "analyze, design and build applications for others with no further training.

"It's just not true," he said, cautioning that the fact that APL is easy to use does not negate the need for training.

APL users' isolation comes because they are often the only people in the department who write programs, Metzger said.

He recommended providing a budget for computer-related publications and attendance at advanced training courses and APL conferences as ways to avoid the problems for the user in APL Siberia.

Inefficient APL implementations are those which make it possible to generate a defined function that is faster to write than an APL primitive, yet produces the same results. Vendors who market this type of implementation "force people to write programs in unreasonable ways to get reasonable performance."

Faced with such an implementation, the APL user should either pressure the vendor into correcting the situation or find another vendor, according to Metzger's paper.

Surprisingly, Metzger continued, incorrect APL programming methods are a direct result of a programmer's previous experience with other languages.

Best Raw Material Needs Best Tools

TORONTO — "APL is the finest raw material" for building application systems, Robert Metzger informed attendees at the 1980 APL Users Meeting here.

However, APL users need the finest available software tools to manipulate that raw material if they hope to make programming productivity increases a reality in their organizations, he warned.

Metzger, a technical branch manager from Rochester, N.Y., office of I.P. Sharp Associates, Inc., divided the programming tool into categories described as "internal and external."

Idioms, pseudo-primitives, building blocks and templates are internal in that they become part of the final product, he explained. Generators, utensils and documentors are external because they do not become part of the target system and, in the case of documentors, don't usually produce APL code.

"Mastery of a standard set of APL idioms is essential to productive APL programming," Metzger claimed. Working with these idioms is comparable to a person learning a natural language who begins by "processing one letter at a time," but soon moves up to syllables, words and phrases. The most productive APL programmers write whole lines of code at once and each line contains one or more idioms, he said.

Pseudo-primitives are the next level up from idioms in the APL semantic structure, according to Metzger. They are defined functions that normally take more than one statement to implement and

are either variants of existing APL primitives or functions that are complementary to the primitives. Common pseudo-primitives include the string search, string replace and join array, he said.

Building blocks differ from pseudo-primitives in that the input sources and output targets are not rectangular arrays, he continued. They normally take arguments and return results that are usually control information rather than data requiring transformation.

Often incorporated into application packages, building blocks include interactive input, terminal control, output formatting, file handling, data base management and data conversion from non-APL sources.

Template Code

"Templates," as used by Metzger, do not refer to the plastic forms so familiar to any programmer who has drawn his own flowcharts. Instead, he defined a template as general code which is altered or augmented to fit a specific situation. Its chief advantage is that it is already debugged and can be custom-tailored to fit organizational needs, he explained.

APL generators are related to macro processors available for PL/I and some assemblers but are "more powerful because the full APL language is available," according to Metzger. If an installation makes frequent use of similar file structures for different applications, a generator that creates the necessary file cover functions might be a worthwhile tool.

Languages such as Fortran, Cobol, PL/I and Algol are scalar-oriented and allow only a single piece of data to be processed at a time. This orientation makes explicit looping both a "necessary and effective" technique, he said.

In contrast, APL is array-oriented and current imple-

mentations are interpreted rather than compiled. This makes explicit looping expensive and the end result is programs that can require more time to write as well as taking more time to run.

"APL applications require APL methods," according to Metzger.

THE 2M ADVANTAGE

PRINTERS

- RO. • KSR • ASR
- 16K BUFFER
- WIDE CARTRIDGE
- IMPACT
- HIGH SPEED
- LETTER QUALITY
- DESK TOP
- BI-DIRECTIONAL
- DUMB
- 132 CHAR
- APL
- MEMORY
- 18" SCREEN
- DETACHABLE KEYBOARD
- SCREEN FORMATTING
- GRAPHICS

VDT'S

MICRO'S

ALTO'S SINGLE 8" DISC • ALTO'S DUAL 8" DISC
ALTO'S WINCHESTER HARD DISC

STORAGE

FLOPPY DISC • MAGNETIC TAPE

MODEMS/COUPLES

103/113 COMP. (300 BAUD) TRIPLE MODEM (103/113/212/3400)
212 A COMP. (1200 BAUD) ACOUSTIC 1200 BAUD (3400)
202 COMP. (1200 BAUD) ACOUSTIC 1200 BAUD (202)
291C COMP. (2400 BAUD)

NEW NEC 55 R/O WITH 16K BUFFER **NEW** DATA MEDIA VDT'S

NEW SUPPLY DIV. 800-526-2288 201-227-7789
• ACCESSORIES • ACOUSTIC COVERS • CABLES • PAPER • THERMO PAPER •
• RIBBONS • PRINTWHEELS • DISKETTES • MAGNETIC TAPE • ANTI STATIC MATS •

2M CORPORATION TOLL FREE 800-526-2288
IN 201-227-7788
20 MONTESANO ROAD
FAIRFIELD, N.J. 07006

Page 24

EDITORIAL

DISASTER PLANNING

The recent flooding of the U.S. Census Bureau computer center where two mainframes were irreparably damaged (CW, Oct. 15) should serve as a warning to all DP managers.

The flooding was caused by an accidental discharge of the center's water sprinkler system, and in addition to the two units permanently out of commission, there are two more units partially out of commission.

AVOID COMPUTER DISASTER

HOW SECURE IS YOUR COMPUTER ROOM? Millions of dollars are spent each year on sprinkler systems, Halon systems, and fire insurance for the protection of a company's computer center. But what would you do: 1. IF A WATER PIPE BURSTS; 2. IF A SPRINKLER MALFUNCTIONS; 3. IF THE ROOF LEAKS; 4. IF THERE'S A FIRE ON ABOVE FLOOR; 5. DURING CONSTRUCTION

A DEVICE THAT CAN PREVENT LOSS FROM THESE DISASTERS ARE PROTECTIVE COVERS. WE MARKET CUSTOM FIT, 12 GAUGE VINYL COVERS THAT ARE:

- (A) TOTALLY WATERPROOF
- (B) TOTALLY DUSTPROOF
- (C) EASILY STORED

Below Are A Few Of The Companies Protected With Covers From The House Of Schiller.

- CITIBANK
- CHEMICAL BANK
- C.I.A.
- NEW YORK TIMES
- FEDDERS CORP.
- UNITY BUYING SERVICE
- HOME INSURANCE CO.
- TEACHERS INSURANCE CO.

HOUSE OF SCHILLER
Computer Security Division
41-40, 27th Street,
Long Island City, N.Y. 11101
(212) 361-8787

I am interested in your product.
 Send me more information. Call me with more information.
Name. Title. Co.
Address. City. State.
Zip. Phone.

CW 126

Call or
HOUSE OF SCHILLER
COMPUTER SECURITY DIVISION
41-40 27th Street, Long Island City, N.Y. 11101
(212) 361-8787

CDC Offers Rival to IBM 3380 Disk System

By Tim Scannell
CW Staff

MINNEAPOLIS — Control Data Corp. today introduced its head-to-head competitor with IBM's 3380 disk system, bringing to three the number of plug-compatible alternatives to the IBM product.

CDC's 33800 storage unit and 38800 controller are priced about 15% less than IBM's offerings and reportedly feature an enhanced dual-access option that allows each actuator of a disk storage unit to be addressed through two internal data paths. With the CDC option, two concurrent data transfers can occur using any two actuators in a storage string.

The dual-access feature usually comes into play in the event of a channel, controller or storage director malfunction to ensure continued data availability, but can also be helpful to alleviate bottlenecks in high I/O environments, a CDC spokesman explained.

Two Pathways

A dual-access-type feature is available on IBM's 3380, called dynamic path select, and on the plug-compatible alternatives offered by Memorex Corp. and Storage Technology Corp. But, CDC's unit is the only device to offer two data pathways for each actuator in a storage string, the spokesman claimed.

Like IBM's 3380, introduced last June, CDC's storage unit incorporates

Workshops Scheduled On Long-Range Plans

ROCKVILLE, Md. — Five-day workshops on "How to Develop an Effective Long-Range Data Processing Plan" will be offered in five U.S. cities and in London by Keston Associates.

The workshops will be conducted Feb. 2-6 in Ft. Lauderdale, Fla.; March 23-27, Washington, D.C.; April 20-24, San Francisco; June 1-5, London; and Aug. 17-21 in the Outer Banks of North Carolina.

The cost of attending a U.S. workshop is \$795 per person; the London workshop costs \$1,000. Keston Associates is at 11317 Old Club Road, Rockville, Md. 20852.

thin-film head data recording technology, which allows the device to read and write data at a rate of 3M char./sec. The CDC version can also store up to 630M bytes per actuator, 2.52G bytes per storage unit and 10.08G bytes per storage string (which is a collection of 16 actuators).

However, each of the controllers' two independent control paths, called storage directors, can handle up to 16 actuators, allowing for an ultimate data capacity of up to 20.16G bytes, the spokesman said.

Unlike IBM's 3380, the 33800 has a built-in processor that handles remote diagnostics. The CDC processor can be hooked up to the user's telephone to check out the unit from any of the firm's remote field maintenance of-

fices, CDC said. Presently, user's of IBM's device have to attach a "black box" type of diagnostic processor that is acquired separately from the storage unit.

Other features of the 33800 include count-key-data functions that are said to provide format continuity; rotational position sensing, which permits the channel and storage director to disconnect during periods of rotational latency for improved system performance; and a format write release feature that enables the channel and storage director to disconnect while the remainder of a track is being erased.

First customer shipments of the CDC 33800 are scheduled to be made in the second quarter of 1982, while the 38800 controller will be shipped dur-

ing the second quarter of this year. By comparison, the IBM 3380 shipments are scheduled to begin sometime within the next few months. However, for a new customer, the wait for a 3380 storage system may be more than two years, the CDC spokesman claimed.

CDC's 33800s cost from \$66,000 to \$120,000, depending on the configuration. Lease prices range from \$1,200/mo to \$2,200/mo. Maintenance on the storage device costs from \$240/mo to \$470/mo.

The 38800 control unit sells for \$51,960 with monthly lease and maintenance prices of \$1,299 and \$176, respectively.

Additional information is available from the firm through Box O, Minneapolis, Minn. 55440.

We've been making your System/34 more productive.



MPL

IBM 3033 AND AMDAHL

EUROPEAN MARKET CONVERSIONS

FOR THESE AND OTHER 60Hz OR 415Hz COMPUTERS

- NO ALTERATION TO COMPUTER NECESSARY
- SIMPLE INSTALLATION ON 50Hz MAINS

MPL COMPUTER POWER SYSTEMS
Manufacturing Processes Limited
Belvedere Works, Bilton Way,
Hayes, Middlesex, England
Tel: 01-848 9871 Telex: 934110

Meet the newest member of the Decision Data family of System/34, System/38 peripherals: the 3751-11 Display Station.

Plug-compatible with your IBM System/34 and System/38.

People-compatible with your operators.

With all the things that do so much for operator comfort—that reduce fatigue, ease tension, and in turn, improve efficiency and boost productivity: document holder, movable keyboard, palm rest, adjustable clicker/alarm, screen tilt, non-glare filter, field convertible numeric

pad, cursor position display, expanded error message display, and automatic dimming.

It's easy to use. Easy to move. Easy to pay for on lease or purchase. And easy to get because our delivery is quick. And it's the first of a new series of display stations we've prepared for System/34 and System/38 users.

**Fits in like everything else we make.
And like they make.**

We offer more System/34 and System/38 peripherals than any other independent peripheral manufacturer. And we offer more features than IBM.

In Federal DP Management Panel Calls GSA More Obstacle Than Help

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Confirming the complaints of many federal agencies and government DP contractors, a panel studying the General Services Administration (GSA) recently reported the agency's efforts to provide governmentwide DP management functions are more an obstacle than a help.

"Assessments of the GSA performance in the ADP area," said the study group established by the National Academy of Public Administration (Napa), "indicate major deficiencies and continuing dissatisfaction with GSA performance."

Recommendations for improving the branch that oversees federal DP and telecommunications procurements, the Automated Data and Telecommunications Service (ADTS), were part of the panel's overall suggestions for improving operations.

The Napa report called for a number of administrative and legislative initiatives to upgrade the administration's functions. One option put forward was to set up the agency as a government corporation under a chief executive officer and board of directors appointed by the President.

Whether the agency is made into a corporation or just more efficiently

structured, there are a number of long-standing problems that must be corrected, the report said. Napa noted as particular problems the GSA's cloudy and constantly changing mandate and the rapid turnover in executive positions.

The agency has had seven administrators in the last 10 years. In addition, the panel said, there have been turnover problems in high-level ADTS offices.

While the report approved of many of the changes that have been made by ADTS Commissioner Frank Carr, the Napa panel listed the following several criticisms of that group's operations.

- "There is no central office with responsibility for long-range planning for ADP acquisition and utilization. This is a particularly important omission in an area involving rapid technological change," the report said. "There has been a continuing lack of centralized policy direction and planning coordination."

- "Little effort has been devoted to assessing the technological change that has already occurred, much less to anticipating future changes and the potential of such changes for government management."

Because DP and telecommunications management are carried out as separate functions, "Little consideration has been given to the emerging technological merger of these two fields," according to Napa.

- "ADTS has not developed the requisite individual and institutional capacities to adequately perform the roles and functions envisioned for it." GSA's difficulties in attracting and keeping qualified personnel are magnified in ADTS, whose highly skilled DP professionals can obtain better paying jobs in the private sector or elsewhere in government, the report said.

- "Frequently the computers used in GSA operations are old and technologically obsolescent." The agency's reliance on outdated equipment and software "has caused many user agencies to be skeptical of the capability of ADTS to help them with their own needs," the report added.

- "ADTS relations with customer agencies have been characterized by conflict and frustration." The report termed this "a natural condition" given the service's control over the DP operations of other agencies and departments. "However," the panel said, "the natural tension . . . is aggravated by the perception of many user agencies that ADTS lacks the technical competence to be of genuine assistance."

- "The most common complaint of user agencies is the time it takes — anywhere from two to five years — to get approval for procurements. This results, the panel said, in the acquisition of equipment that is obsolete or nearly obsolete."

The study group also decried the "paternalistic control" over ADTS functions exercised by the House Government Operations Committee. The committee has virtual veto power over all large DP and telecommunications procurements.

"It is apparent that ADTS needs less intervention by Congress and especially the House Government Operations Committee," the report said.

More speed. More flexibility. More performance for a lesser price. Price, in fact, is the only thing we offer you less than IBM.

Our 150 cps serial printer is priced lower than their 120 cps unit, and has more features. Our 650 lpm line printer can be upgraded to an 800 lpm or 1000 lpm line printer on the spot, whenever you need the speed. And our 800 lpm printer upgrades to 1000 lpm just as easily. You only pay for the speed you need when you need it. If you need something else, we offer other printers from 300 to 1500 lpm.

Workstations, serial printers, line printers: nobody offers as many System/34 and System/38 plug-compatible peripherals. All supported by our 250 service specialists at more than 75 locations in the U.S. and Canada.

See for yourself. Call 215-674-3300. Or write Decision Data Computer Corporation, 100 Witmer Road, Horsham, PA 19044.

 **DECISION DATA**
COMPUTER CORPORATION
makes computing cost less

HIRING PROGRAMMERS, ANALYSTS OR OPERATORS?



THE VALIDATED
WOLFE TESTS PREDICT
ON-THE-JOB SUCCESS

Call collect or write:
Stephen Silver, President
WOLFE COMPUTER APTITUDE TEST
Box 319, Oradell, N.J. 07649
514-337-4139

- VALIDATED • JOB-RELATED TESTS
- DESIGNED FOR TODAY'S HIRING

HP/1000 USERS

ARE YOUR PROJECTS LATE BECAUSE OF PROBLEMS MAINTAINING AND ORGANIZING SOURCE FILES?

The Source Control System (SCONS/1000) provides the necessary tools for efficient management of a dynamic collection of source files. SCONS/1000 minimizes the problems of organizing and maintaining source files during the entire project life cycle.

FEATURES

- Allows organization of files on a per project basis.
- All revisions and releases of any number of files are maintained simultaneously.
- Forces controlled access to "released" software for changes.
- Each user may have a restricted set of possible commands.
- Only the differences between the old and the new files are stored.
- Disc storage requirements are greatly reduced.
- Project may share common files. File owners can restrict access of projects which share the files.
- Optional automatic revision level updating.
- Optional automatic insertion of current date, time, and comments into the file.
- Batch and interactive operating modes.
- Listing, compilation or user defined operations may be performed on all files or subsets of all files in a project.
- Easy to operate even by infrequent users.

For more information, call Chuck Nickerson (201-583-4422) or write to CCS.

CCS

CORPORATE COMPUTER SYSTEMS, INC.

675 Line Road, Aberdeen, New Jersey 07747

Telephone 201-583-4422

Off-Line Data Communications.



All it takes
is our
MDRS-9.

The MDRS-9 communicates with the following terminals:

- Cassette
- CRT
- Floppy Disc
- Magnetic Card
- Main Frames
- Paper Tape
- Point-of-Sale
- Word Processors
- TWX
- Hand-Held Terminals
- Magnetic Tape to Magnetic Tape
- OCR
- Photo Composers
- Printers

It communicates in asynchronous and synchronous modes at data rates of 50-9600 bits/second. And no software is required!

The MDRS-9 serves as a computer front end to poll remote terminals via direct-dial, private line or TWX service. Computer compatible magnetic tape is the interface between the MDRS-9 and your computer.

Since our initial installation in 1971, the number of applications has grown to include order entry, payroll, production control, inventory, shipping, commodities transfer, publishing and many more.

For additional information and to discuss your application in detail, use our WATS number (800) 638-9665 or call (301) 992-7700.

Ask about Mitron's new Intelligent Autodialer.



MITRON
Systems Corporation
2000 Century Plaza
Columbia, Maryland 21044

Commerce Makes Appeal

Businesses Urged to Adopt OECD Privacy Guidelines

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The U.S. Commerce Department is making a direct appeal to U.S. corporations to publicly adopt personal data privacy guidelines recently completed by the Paris-based Organization for Economic Cooperation and Development (OECD).

In a letter to 750 U.S. business leaders, the department recommended adoption of the guidelines as the best way to assure unimpeded transborder flows of automated personal data.

The guidelines, approved late last year by the U.S. and its OECD partners, recommend basic principles of personal data protection and urge nations to "endeavor to remove or avoid creating, in the name of privacy protection, unjustified obstacles to transborder personal data" [CW, Nov. 3].

The guidelines document sets standards for data gathering and handling and calls for "appropriate security measures" against accidental or unauthorized destruction, loss, access, alteration or dissemination.

OECD Rights

The document also recognizes the right of OECD members to demand stricter data protection measures than recommended in the guidelines' minimal standards. To forestall data flow restrictions unacceptable to U.S. multinational firms, the U.S. government

is urging American corporations to publicly implement the guidelines.

Under the terms of the guidelines, OECD members would be justified in restricting data flows to countries that do not substantially observe the principles set forth. Because the U.S. does not have privacy laws corresponding to those of many industrialized nations, particularly in Europe, the Commerce Department is recommending compliance as the best bet for maintaining unimpeded data movement.

Besides the mailing to U.S. businesses, the Commerce Department, with the support of ex-Secretary of State Edmund Muskie, had tried to set up a meeting between Carter Administration Commerce Secretary Philip Klutznick and 25 corporate executives to urge the businessmen to sell the guidelines to U.S. firms and associations.

In a Dec. 22 letter to Klutznick, Muskie said "I believe that American businesses and trade associations will understand that it is in their own interest to gain international acceptance of the principles of the guidelines. Without such acceptance, other nations may raise barriers that would impede the flow of personal data and other commercial data communications."

The meeting was called off because there was not enough time left in the Carter Administration to set it up, but the effort will be pushed in the new Administration, according to a Commerce official.

The department is urging that businesses go as far as possible to implement the guidelines in their daily operations because there have been no public statements from European nations about their effect in tempering privacy legislation and data protection efforts, according to William Fishman, a senior policy advisor in Commerce's National Telecommunications and Information Administration.

But, Fishman said, "in the course of negotiating the guidelines and in many discussions outside the negotiation process," U.S. representatives found their European counterparts "regarding the guidelines and voluntary compliance in the U.S. as a very important advance."

Too Early to Tell

Fishman was careful to point out that European data protection authorities are only beginning to set policies for data protection. It is too early, he said, to gauge the guidelines' effectiveness in staving off data flow restrictions. For that reason, he said, U.S. firms should do all they can now to publicly embrace and implement the guidelines.

While some companies may believe a simple statement endorsing the guidelines may be sufficient, Fishman speculated that "might get them in the front door, but that doesn't get them the data. Because the Europeans are going to say 'All right, you've agreed to it, now tell us how you're going to implement it.'"

Asked how companies should implement the guidelines, Fishman said the U.S. government is being "very cautious not to tell industry how to do this."

"That's not our role and I really wouldn't know what to tell them."

COMPUTERWORLD



... the one weekly newspaper that's designed to fulfill your unique "need to know" . . . the one newspaper that can give you all the current information you need to benefit you, your organization and your career progress . . . 52 weeks of incisive news, commentary and special reports . . . subscribe today, use the attached postage paid order form.

- Please enter my subscription
(details on back)
- I'm already a subscriber,
but I'd like you to
change my:
 - address
 - title
 - industry
 - other

My current mailing label is attached
and I've filled in new information
on the other side

Put old label or label information here

Please send me COMPUTERWORLD for one year RATES; United States—\$36 Canada, Central & South America—\$65 Europe and Near East—\$125 Other Foreign—\$175 (Airmail Service)

(MC Only - List four digits above your name)

卷之三

100

If charge we must have
Expiration Date

Date: _____

卷之三

first initial middle initial Surname

Vander

x²cos²*x*sin²*x* = 1/2 sin²2*x*

Comisión

Family Name

卷之三

Menzel or

City _____ State _____ Zip _____

Code

Address shown is:

Business
 Personal

Home promotional mail from [Gannett](#)

Computerworld

COMPUTERWORKS

COMPUTERWORLD THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. 375 Cochituate Road, Rte. 30, Framingham, MA 01701
TYPE FACSIMILE / FAX 508-359-2000

Insurance Firms Found Voluntarily Cleaning Up Possible Privacy Abuses

URBANA, Ill. — The insurance industry is cleaning up possible privacy abuses voluntarily, according to a recent survey conducted by the University of Illinois Survey Research Laboratory.

The survey was conducted for Prof. David F. Linowes, former chairman of the U.S. Privacy Protection Commission and Boeschenstein professor of political economy and public policy at the university. The survey results were based on responses from 19 of 91 large insurance and property and casualty companies. Many of the questions were based on abuses uncovered by the privacy commission between 1975 and 1977.

Although no legislative action has been taken since 1977, when the U.S. Privacy Protection Study Commission called for changes in the recordkeeping habits of the insurance industry, some of the commission's recommendations have been voluntarily adopted, the survey found.

'Search Warrant'

One area of concern for the privacy commission was the authorization form signed by individuals when applying for insurance. One insurance executive called it "a search warrant without due process," according to Linowes.

The form contained no expiration date and allowed the persons it authorized to obtain any kind of data from anyone, as opposed to the medical data from physicians and hospitals to which it was meant to be restricted, the professor claimed.

The survey showed three out of every five companies that obtain written authorizations now include an expiration date and 67% indicate the specific party from whom information is sought. Slightly more (75%) indicate the nature of the information being sought while 95% listed the specific purposes for which the institutions may use the information.

The research group found that four of five (82%) insurance institutions currently have a policy for conducting periodic evaluations of their record-keeping systems, and that within the last two years, nine of 10 (87%) have conducted evaluations pertaining to confidentiality safeguards.

While action has been taken on many privacy levels, the survey revealed that some areas lag behind.

While only one of 16 (6%) companies requires information on arrest records, more than one-half (56%) of those responding require information on convictions of individuals, and three of five (62%) institutions collecting information concerning convictions update this information at certain intervals.

The survey found that disclosure policies among the companies vary depending on who is to receive the information.

Three of the five respondents always obtain authorization of the individuals before disclosing information about them to third parties, but the situation changes when dealing with government agencies. According to the survey results, nearly one-half (47%) of

the companies disclose information about individuals to government agencies other than those required by law. Three of four (73%) institutions require subpoenas for such disclosures.

In addition, less than one-half (44%) of the companies inform individuals of their routine disclosure practices to governmental inquiries, while more than one-half (56%) inform individuals of the routine disclosure policies to nongovernmental inquirers. Three out of four companies also limit the type of information released to nongovernmental inquirers.

Regarding the collection of personal data, one-half (50%) still seek information from third parties without written permission. When permission is obtained, more than two-thirds of the firms indicate to the individual the specific third party from whom information is being sought (67%), the specific nature of the information being sought (75%) and the specific purpose for which the information might be used (94%).

Nine of 10 (89%) companies have established executive-level personnel to maintain privacy safeguards, and none of the companies use polygraph tests or other devices to verify information about an individual.

Nine of 10 (88%) institutions check, verify or supplement background information collected directly from individuals, as well as notify the individuals about the background check before such information is collected (93%). All the firms allow the person involved to correct this information, the survey showed.

Three of four (74%) insurance companies use investigative firms to collect or verify information on current or potential policyholders. Most of the firms review the operating policies of these investigators, and all allow the individuals some input into the investigative report.

One of five (19%) insurance companies report medical information obtained from nonmedical sources to other insurance institutions, while seven of 10 (71%) disclose information of previously unknown medical problems to an individual's doctor.

Unknown Safeguards

Although the companies have instituted safeguards, they have failed to let people know about them, the survey indicated.

Less than one-half (47%) of the institutions have a policy to inform individuals of the kinds of records they keep concerning them, while slightly more than one-half (53%) inform individuals of the use of these records within the company. Three of five (59%) companies tell individuals which records they have access.

Five of six (84%) companies inform individuals of the specific reasons for an adverse decision, but only three of five (61%) institutions inform individuals of the specific information which supports these reasons, the survey found. All the companies inform their policy applicants of their rights under current law.

The New Standard For PDP-11 Disk System Technology

**Check with us before you buy,
because we can beat
all prices!**



Know All the Hidden Costs

Only System Designed Just for PDP-11 Family

Designed exclusively for DEC's UNIBUS or MASSBUS CPU's. On the UNIBUS, it's just one card that plugs into any spare SPC slot. On the MASSBUS, four cards plug into any spare existing RH70 standard back plane.

Same Disk Drive as DEC RM02-03, RP06 and RM04-05

We use the same disk manufacturers as does DEC. The RM02-03 is the 9762 CDC 80MB and the new RM04-05 300MB is the CDC 9766. Only the LOGO is different.

Transparent to All DEC Software, Diagnostics and Drivers

You bet! Use your existing Software...no change needed. Runs all DEC's Diagnostics plus has its own. Fully emulates DEC disk Drivers.

Worldwide Installation and Maintenance

Through Data Systems Services, maintenance and installation is provided via CDC for both Drive and Controller. We also offer full PDP-11 system support.

Full Media Compatible?

That's right! You can read or write on our drives. Put it on DEC's and it will play or vice versa. TRULY MEDIA COMPATIBLE.

DRM02-3 80MB Slave

DRJM02 80MB + Controller

DRWM03 80MB + Controller

DRJM04-5 300MB Slave

DRJM04 300MB + Controller

DRWM05 300MB + Controller

RJM07 600MB + Controller

RWM07 600MB + Controller

RM07 600MB Slave

DRP02 200MB Slave

DRWP06 200MB + Controller

DTU45

DTU77

DTU125

Line Printers

Memories

11/34 → 11/70, VAX

Systems

OEM Discounts Available

(714) 770-8024

23901 Remme Ridge Rd.
El Toro, CA 92630

DATA SYSTEMS SERVICES

Union Accepts 28% Raise

Agreement on Pay Hike Ends Lockheed Strike

By Jeffry Beeler

CW West Coast Bureau

BURBANK, Calif. — Nearly 1,700 striking Lockheed Corp. employees, including an undisclosed number of computing personnel, earlier this month resolved a longstanding salary dispute with the company's management.

ment and returned to their jobs for the first time in almost two months.

The work stoppage ended Jan. 14 shortly after members of a labor union at Lockheed's California Co. voted to accept the firm's proposal for a more than 28% pay hike to be phased in during the next three years.

Executives' Conference This Week To Explore 'New Information Era'

NEW YORK — A two-day *Business Week Executive Conference* on "Leadership in the New Information Era" will be held Wednesday and Thursday at the Waldorf Astoria here.

Developed for chief executive officers, corporation presidents, corporate planners, productivity executives, MIS managers and other senior managers, the conference will offer an opportunity for "executives from leading-edge corporations [to] address your fears, answer your questions and enlarge your understanding of information systems," its organizers said.

Keynote presentations will be made by author Isaac Asimov; John Diebold, chairman of the Diebold Group, Inc.; and Joel A. Fadem, a senior research fellow at the University of California at Berkeley's Institute of

Industrial Relations.

Speakers at the conference will address "How Will the Corporate Structure Change?" "Instituting an Information System: The Costs, the Lessons, the Payoffs," "Maximizing and Streamlining Strategic Planning," "How to Start Today to Build the Automated Office" and "The New Technology and the Work Force."

Other topics will include "Playing It Safe: Privacy and Security Issues," "The Bottom Line," "The Colliding Sectors of Information Technology," and "Applying the New Technology."

Attendance costs \$750. Further information is available by writing *Business Week Executive Programs*, c/o McGraw-Hill Conference & Exposition Center, Room 3677, 1221 Ave. of the Americas, New York, N.Y. 10020.

TECH CONTROL BREAKTHROUGH: COMPLETE TURN-KEY SOLUTION JUST \$10,985* FROM DIGILOG

POWERFUL FEATURES AND EXPANDABILITY TO 256 LINES

Now, whether you have a 2 communication lines or 2000, a low-cost turn-key solution from Digilog makes high performance tech control for isolation of communication faults a practical reality. Your Digilog-packaged tech control center will include a complete Network Supervisory System™, a DLM III™ data line monitor and plenty of modem and cable storage space.

If need be, check out all the facts on every tech control product on the market. There isn't a system anywhere that provides the combination of alarms, ease of line access, protocol monitoring, message simulation ability, expandability, easy operation, and low cost of a Digilog turn-key solution.

FEATURE HIGHLIGHTS	DIGILOG
Modem and Cable Storage	✓
Compatible to all RS232 Lines	✓
Modular Expansion (1 - 256 Lines)	✓
Instant Fault Detection	✓
Automatic Visual and Audible Alarms	✓
Push Button Line Access	✓
Protocol Monitoring and Simulation	✓
Line Testing with Bert	✓
Reconfiguration Capabilities	✓
Power Fail Protection	✓
*PRICE (\$-Line Configuration)	\$10,985

For peace of mind in your communication center call (215) 672-0800 or write Digilog Network Control Division, Babylon Road, Horsham, PA 19044

DIGILOG
NETWORK CONTROL DIVISION

The strike was staged by members of Lockheed's Engineers and Scientists Guild (ESG), which serves as the bargaining unit for roughly 2,800 employees representing some 280 job categories.

Computer Positions

An estimated 20% of the union's approximately 1,600 dues-paying members hold computer-related positions ranging from programmer to systems analyst to operations specialist, according to ESG president Richard Cappelletti.

The computer-related portion of the union's membership embraces 24 job classifications and works exclusively on the scientific side of Lockheed's systems operations. A different union represents the company's business-computing personnel, who were apparently unaffected by the ESG-called job action.

Altogether, more than 1,680 members of the ESG's total bargaining unit participated in the just-ended work stoppage, which is believed to be the first in Lockheed's history to involve employees in the firm's scientific computing department, Cappelletti said.

Heart of Problem

The strike began last Nov. 17 when union and company representatives reached an impasse in their negotiations over a new three-year employ-

ment contract.

At the heart of the problem was a dispute over the size of the union members' salary increases. The ESG's rank and file demanded a raise in their cost-of-living allowance as well as a base-pay hike to enable them to maintain parity with the company's hourly workers, who had recently received a hefty boost in wages.

Lockheed's response to the proposed salary increases fell substantially short of the union's demands, and the first in a long series of contract negotiations quickly ensued. But when two months of almost steady labor-management haggling had still failed to produce an accord, the union's membership decided to press its case and walked off the job.

Among the strikers were an undetermined percentage of Lockheed's scientific computing personnel, some of whom belong to the ESG and some of whom do not.

Lockheed's status as an open-shop organization reportedly gives its employees the option of joining a union or remaining independent.

Since last November's abrupt breakdown of contract negotiations, union and management representatives have resolved their salary differences and forged a new three-year employment agreement that grants ESG members yearly pay hikes totaling 11.25%, 9% and 8%, Cappelletti said.

EDP AUDITORS FOUNDATION, INC.

Announces The First

CISA EXAMINATION

(Certified Information Systems Auditor)

- April 10, 1981
- 30 U.S. and Foreign Test Sites
- Developed And Administered By Educational Testing Service (ETS)
- Registration And Fee — \$125 (U.S.)
- Study Guide Now Available From EDPAF At \$15

Exam Covers These Information Systems Auditing Areas:

- | | |
|--|--|
| Application Systems Controls Review | Security Review |
| Data Integrity Review | Systems Software Review |
| Systems Development Life Cycle Review | Maintenance Review |
| Application Development Review | Acquisition Review |
| General Operational Procedures Controls Review | Data Processing Resource Management Review |
| | Information Systems Audit Management |

FOR A
CISA
BULLETIN AND DETAILS,
CONTACT

EDP AUDITORS FOUNDATION
373 S. Schmale Rd.
Carol Stream, Illinois 60187
312/653-0950

Upgrade your virtual system to H-Series performance. Today.

Squeezing more throughput from your virtual system is a complex challenge. STC has a straightforward answer: Balance your virtual I/O with the correct combination of main memory and high-speed paging store.

The question then becomes what is right for your environment. Again, STC is ready to help you find the answer. And since we offer the best of both, we won't promote one at the expense of the other.

Here are some of the basics.

Memory vs. Page Store: fitting the tool to the problem.

By adding main memory with STC's 3700 Universal Memory System, you will experience an immediate improvement in both throughput and terminal response time. This is true because as your real-to-virtual storage ratio increases, paging activity declines, with a consequent reduction

in channel and disk resource contention. Thus each incremental megabyte means faster execution and a higher level of multi-programming; in short, greater productivity. Up to a point that is, for there are some significant bottlenecks which memory cannot resolve.

Over-initiation is a case in point. As you add batch jobs or log-on more TSO or CMS users, the increased job load will eventually result in page thrashing and resource conflict. That threshold can be reached long before your CPU is 100% busy.

As illustrated in the graph, a high-speed paging device, such as STC's 4305 Solid State Disk, will dramatically broaden your system's performance range by decreasing its sensitivity to over-initiation. Faster page response time raises your paging threshold while dedicated paging storage reduces contention on your disk subsystems.

A configuration for your system.

Because your system and job mix is unique, your solution will have its own personality. STC is fully

prepared to help you discover the combination of paging store and memory that fits your cost, performance, and productivity objectives.

Our 4305 Solid State Disk is available in a range of configurations to fit your Amdahl, IBM or other compatible processor. With 0.3 msec. access times, capacities to 45 Mbytes, and transfer rates to 6.0 Mbytes per second, it's the perfect solution to your paging problems.

Our 3700 Universal Memory System is field adaptable to all 370/158, 168 and 303X models. With our advanced chip technology,

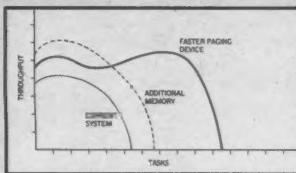
we can take you up to 16 Mbytes and save you space, power and air-conditioning costs in the bargain.

Then, too, we back both products with our uncompromising Systems and Field Engineering support to assure you get the benefits for which you have paid.

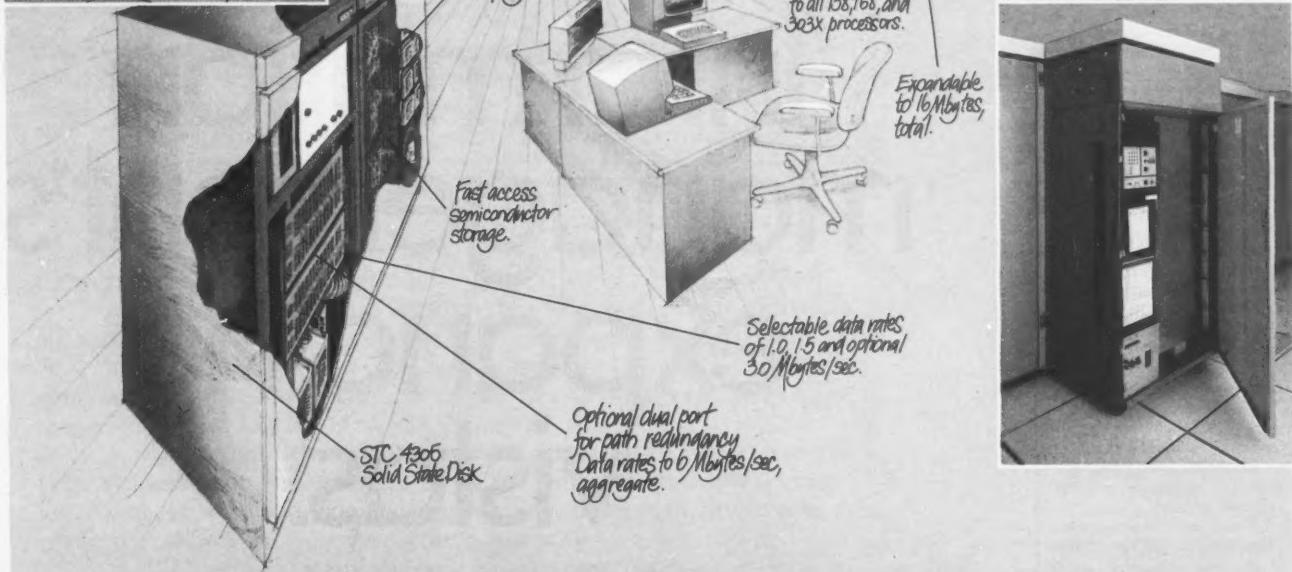
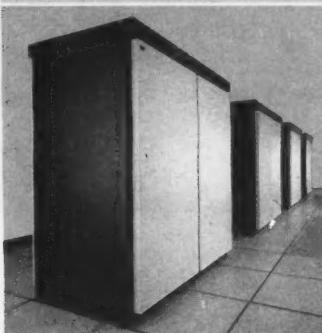
More MVS and VM productivity. Now.

For details, call your local STC sales office. Or write: Storage Technology Corporation, Mail Drop 3M, 2270 S. 88th Street, Louisville, CO 80027. Phone (303) 673-5151.

Save as much as 80% on space, power, and air-conditioning.



STC 3700
Universal Memory



STORAGE TECHNOLOGY CORPORATION
Fulfilling the promise of technology.

Papers on Software Technology Needed for Maryland Symposium

WASHINGTON, D.C. — The National Bureau of Standards (NBS) is soliciting papers to be presented at the "Trends and Applications 1981: Advances in Software Technology" symposium.

The symposium, to be held in Gaithersburg, Md., May 28, will be cosponsored by the NBS Institute for Computer Sciences and Technology, the

Washington D.C. Chapter of the Institute of Electrical and Electronics Engineers (IEEE) Computer Society and the IEEE Washington Section.

The program committee said it is interested in papers of a tutorial nature and those which present new research in areas including: software engineering, software quality control, distributing process-

ing, computer communications, data base software, programming and operating systems, secure software, performance evaluation and novel applications.

Authors should submit three copies of a 1,000-word abstract by Jan. 30 to F. Terry Baker, Program Chairman, IBM-FSD, 10215 Fernwood Road, Bethesda, Md. 20014.

'Activity Approach'

SAN JOSE, Calif. — "Project Management for On-Line Interactive Manufacturing Systems" is a four-day class that reportedly will use special techniques to help teach project managers how to communicate better with their colleagues.

Organized by Scott-Kennard & Associates, Inc., the agenda includes seminars and workshops on project planning, evaluation and management. The teaching technique, devised by Scott-Kennard, is called Activity Approach.

The class is offered Jan. 26-28 at the Hyatt San Jose; it costs \$985 and will be limited to 30 people. More information is available from Scott-Kennard & Associates, Inc., P.O. Box 23839, San Jose, Calif. 95153.

Automated Office Seen Beset With Problems

By Robert Glass
Special to CW

SEATTLE, Wash. — Office procedures are subject to two problems:

- The basic information flow is simple, but there is an immense exception handling process.
- The procedures evolve constantly.

These problems were cited by Clarence A. Ellis, office automation researcher, of the Xerox Corp., Palo Alto Research Center (Parc), at a recent University of Washington Computer Science Colloquium here.

Ellis discussed the efforts of Parc's Office Research Group to understand and research the automation of offices. The group has produced a system called "Officetalk," which is based on the electronic desktop concept — a video screen is used to simulate the top of a typical office desk, even to stacking and unstacking reference materials, and complete with clutter!

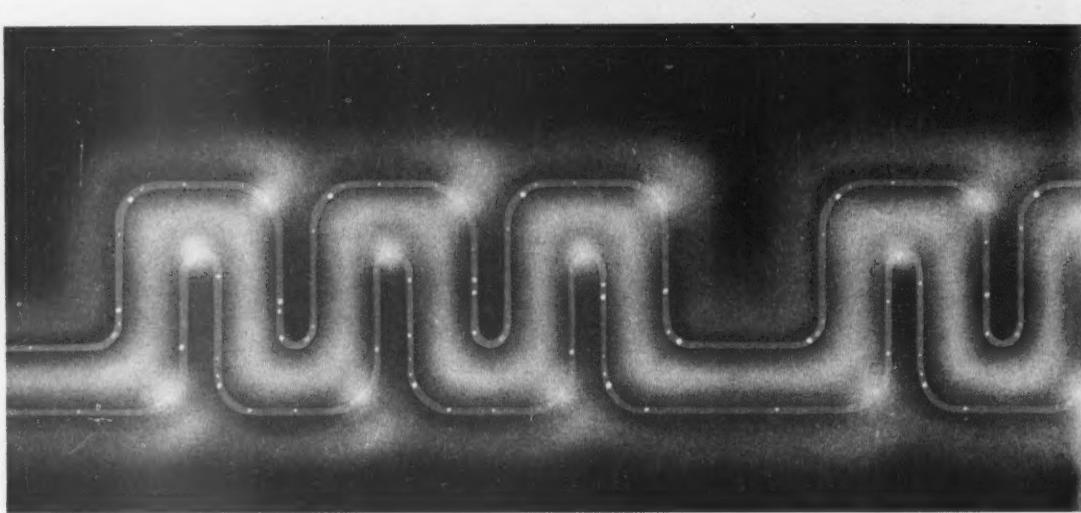
Officetalk also uses the concept of "intelligent forms" — paperwork in electronic form which knows its own attributes, such as destination; turns "red" as its processing deadline is approached; and gets "angry" when it is bottlenecked, reporting its status to management.

Research problem areas exposed by the research and needing further study, according to Ellis, are:

- Programming languages for naive users.
- Distributed operating systems.
- Artificial intelligence.
- Database design (e.g. personalized data bases with idiosyncratic access).
- Social implications.

Parc is seeking the assistance of academic computer science programs in these areas.

Officetalk has been used experimentally in some actual office situations, with mixed results. In one situation, an office worker took the researchers aside and said "If our supervisor weren't here, we'd really tell you how the office runs."



Information management's expanding vistas.

Between Parts of Texas, Louisiana

Interstate Link Speeds Unemployment Claims

By Ann Dooley
CW Staff

HOUSTON — Unemployed workers in parts of Texas and Louisiana are receiving speedy unemployment compensation through a first-of-its-kind computer link between the two states.

Unemployed workers living in one state who file for benefits they have coming from the

other state, previously had to wait as long as three weeks to receive an interstate unemployment claim.

With the computer system in operation, turnaround time is an average of 10 days, officials from the two states said.

Developed voluntarily by Texas and Louisiana as a two-year pilot project, the network is viewed by planners as the

first step toward someday building a similar system to speed interstate claims handling to all 50 states.

The two-state hookup encompasses 67 unemployment claims offices in Louisiana and 26 in southeast Texas. Separate IBM 370/158 systems in each state provide stored data on that state's unemployment benefit files.

The link was accomplished smoothly because of the compatibility of the two state's systems, officials said.

Immediate access to the unemployment data allows claims representatives to quickly predetermine an individual's eligibility for unemployment insurance as well as the amount due.

Until now, there was no way

to predetermine a claim. Instead, a form was filled out and sent to the respective state for processing and eventual payment; a method that frequently created a heavy work load and a payment backlog.

With the interstate link, when a person applies for a claim from a neighboring state, a claims representative calls up the unemployment files on a CRT terminal to determine the eligibility and the amount of compensation due.

Once the necessary information is found, it is mailed to the neighboring state where it can be processed without delay. In the future, claim information will be sent directly over the network, further speeding the payment process, according to officials.

TTI to Stress Office Systems In Spring Series

LOS ANGELES — The Technology Transfer Institute (TTI) spring seminar series this year will emphasize technology in the office environment.

Two five-day sessions led by James Martin will begin with a session on "Senior Management" for nontechnical managers and continue with a four-day seminar on "Productivity Through the New DP Revolution." These are offered April 6-10 in Las Vegas and April 13-17 in New York.

Three seminars will be held April 13-17: in Washington, D.C., on software engineering, in Los Angeles on "X.25 and Other Packet Switching Protocols" and in Boston on "Capacity Planning."

TTI has organized two more sessions slated for April 22-24. One in San Francisco will discuss "Satellite Data Networks" and the other, in New York, will consider "The Office of Tomorrow."

Registration information is available from TTI through P.O. Box 49765, Los Angeles, Calif. 90049.

Consultants/Experts Wanted

Consultants and/or experts whose expertise is in the EDP data communications, or office systems areas are invited to submit their outlines for nationally held seminars of 2 or 3 days' duration, conducted approximately 15 times or more a year. Must be able to communicate with experienced personnel in their field. Unique opportunity for recognition and compensation with distinguished industry sponsor. For consideration, please send an outline of each seminar you can teach plus a copy of your biography.

Joseph Menendez
Manager, Educational Programs
Datapro Research Corporation
1805 Underwood Blvd.
Delran, NJ 08075

Dataphone® digital service, the nation's largest and best-serviced network of its kind, greatly extends the capability of the Bell System communications network—already the world's most advanced information management system. And Dataphone digital service continues to expand.

Using a functionally discrete digital network, it now covers most of the nation's major data centers, and by the end of 1981 will be available in 96 service areas comprising more than 350 cities.

Digital end to end, its outstanding performance offers users extraordinary accuracy and dependability, greatly increasing efficiency and throughput in data communications.

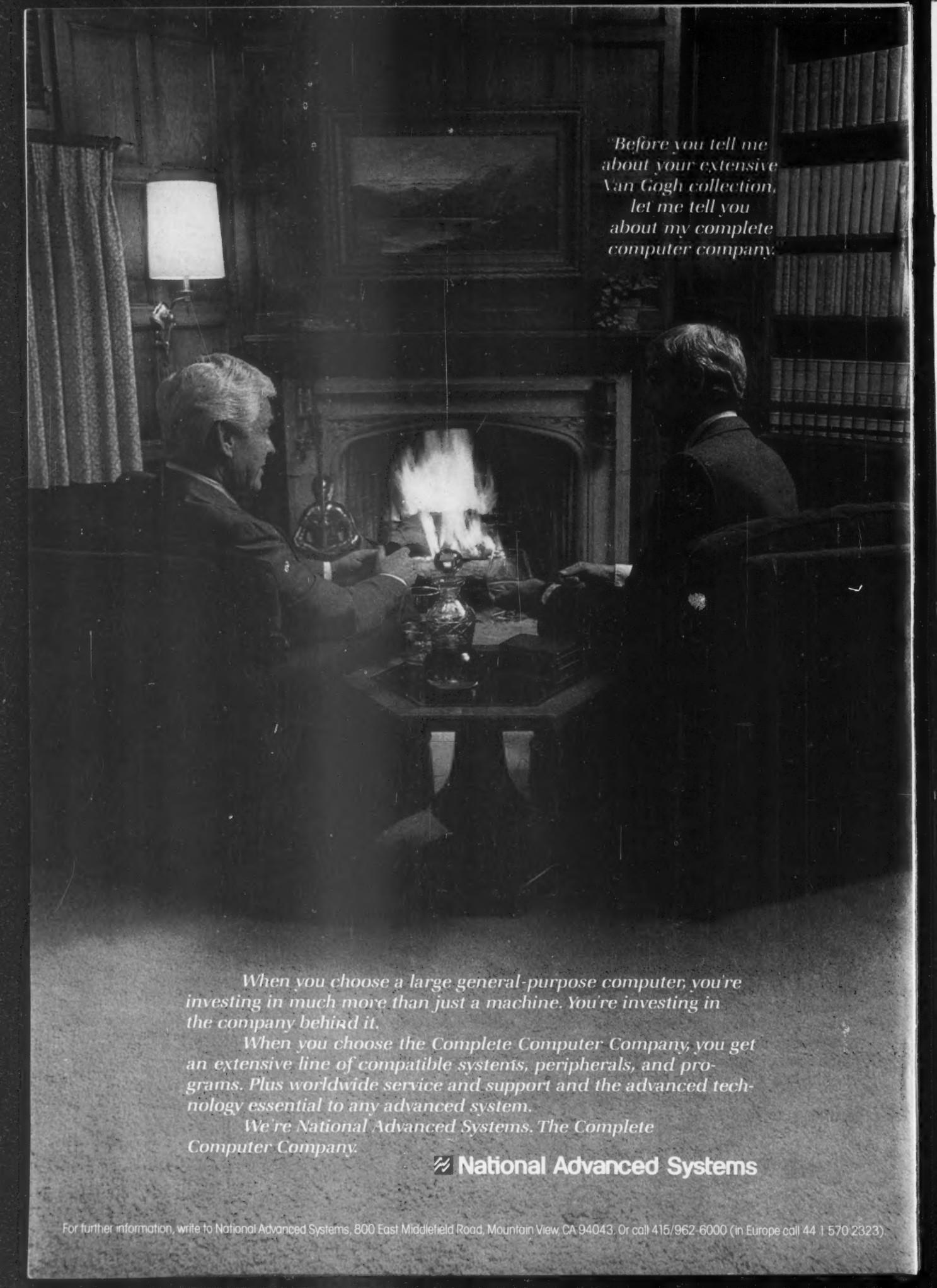
With its assortment of speeds and enhancements, the service will accommodate a wide variety of applications, involving two stations or hundreds. And Dataphone digital service provides guaranteed performance, and virtually eliminates excessive downtime, slow restoration time, slow response, repeated transmissions and scheduling backlogs.

This service demonstrates the expanded needs the Bell voice and data networks are meeting for American business. Companies coast to coast have found that our unparalleled knowledge of advanced communications gives them unprecedented information management capability.

One call to your Bell Account Executive can put our knowledge to work for your business.

The knowledge business





*Before you tell me
about your extensive
Van Gogh collection,
let me tell you
about my complete
computer company.*

When you choose a large general-purpose computer, you're investing in much more than just a machine. You're investing in the company behind it.

When you choose the Complete Computer Company, you get an extensive line of compatible systems, peripherals, and programs. Plus worldwide service and support and the advanced technology essential to any advanced system.

We're National Advanced Systems. The Complete Computer Company.

 **National Advanced Systems**

DPMA Workshops Slated On Interpersonal Skills

DALLAS — The Data Processing Management Association (DPMA) will sponsor a series of one-day workshops designed to improve the communication and interpersonal skills of all levels of DP personnel.

Titled "Influencing Persuasively," the workshops will be held in seven U.S. cities in February and March.

The objective of the workshops is to increase the DP professional's ability to gain user commitment and action, according to Donald E. Price, DPMA president.

Price said other objectives are to get DP professionals to recognize and use their influencing strengths, communicate effectively without technical jargon, listen actively, increase productivity and make more effective decisions through improved communications.

The workshops will make use of a wide range of instructional media, with a heavy accent on group and class participation, according to DPMA spokesman Vincent Caracio.

Iverson to Speak On APL Uses At ACM Course

WASHINGTON, D.C. — Dr. Kenneth Iverson has been invited by the Washington, D.C., Chapter of the Association of Computing Machinery (ACM) to be the international speaker at a seminar scheduled to take place at the University of Maryland Feb. 26.

Iverson will discuss the problems of managing the development and use of APL applications and the provision of APL services.

A member of the National Academy of Engineering, Iverson received the American Federation of Information Processing Societies' Harry Goode Memorial Award in 1971 and the ACM Turing Award in 1979. He has authored three texts: *A Programming Language* (1962), *Algebra: An Algorithmic Treatment* (1972) and *Elementary Analysis* (1976).

Registration fees for the seminar vary. Further details are available from ACM headquarters, Professional Development Committee, P.O. Box 39110, Washington, D.C. 20016.

SNA

Need true SNA/SDLC compatibility now?

Our second generation of SNA/SDLC interfaces for your terminals, micros, minis and word processors is ready!

- * high and low level software designs to assist your architecture decisions
- * executable code to be integrated with your own software
- * single card protocol converter/emulators
- * host resident and micro based support tools for SNA/SDLC protocol compliance verification.

MODERN SOFTWARE DESIGN
18590 Ventura Blvd., Suite 202
Tarzana, CA 91356 - (213) 343-2083

"We'll use films, video tapes, some lectures and lots of small workshops, but will in general be very participation-oriented," Caracio said. "You don't learn communications just by listening to others."

The per-participant cost is \$150, with a \$25 discount available to DPMA members. The dates and sites of the workshops are: Dallas, Feb. 19; Houston, Feb. 24; Atlanta, March 10; Washington, D.C., March 12; Seattle, March 24; San Francisco, March 25; and Los Angeles, March 27.

For more information, contact Vincent Caracio, DPMA Education Foundation, Dept. THC, Suite 710, 7616 LBJ Freeway, Dallas, Texas 75251.

Program Offers Women Two-Year Computer Degree

BOSTON — Women interested in technical careers can enroll in a special graduate program that will enable them to obtain a computer science or engineering graduate degree in two years.

Boston University's Late Entry Accelerated Program (Leap) is open to 30 women beginning in May.

Applications now are being accepted for the program designed to train women with bachelor's degrees in physics, chemistry, mathematics or engineering, for careers in computer science or engineering. The program is specifically aimed at women who graduated from college before 1979 and have been out of

the workforce or in other fields.

Supported in part by the National Science Foundation, Leap will begin with a week's orientation and a core course to introduce participants to computer science and engineering.

There will be preparatory courses in mathematics, physics or engineering. The group will complete the preparatory segment of the program in August 1982 and then divide along elective pathways and earn a nine-month master's degree.

More information is available from Sonia Parker, Boston University, College of Engineering, 110 Cummings St., Boston, Mass. 02215.



A Subsidiary of SPIRELLI & ASSOCIATES, INC.

Performance Improvement through Advanced Technical Education

CompEd, a subsidiary of Spirelli & Associates, Inc., is the realization of a progressive approach to technical education. We offer a comprehensive selection of LIVE, high level DP instruction utilizing PROFESSIONAL EDUCATORS & FULLY EQUIPPED facilities. These intensive courses are lecture-based and may include "hands-on" use of in-house computers. All courses are supported by a custom-designed mix of collateral material.

DATA COMMUNICATIONS

CICS/VS

Command-level Applications Programming

- Develop and maintain CICS/VS command-level application programs • Determine trade-offs for best use of various CICS/VS facilities • Make use of basic input/output facilities of BMS as they relate to the IBM 3270IDS or 3270 compatible terminals

CICS/VS

Macro-level Applications Programming

Course #

Dates

CV-22 Feb 2-6

CV-23 Feb 9-13

CV-24 Feb 23-27

CICS/VS

Testing & Debugging

CM-02 Send for schedule

CICS/VS

Design

CT-11 Send for schedule

CD-13 Send for schedule

ACCESS METHODS

VSAM

Using Access Method Services (AMS)

- VSAM Overview • VSAM Control Blocks • File Design • VSAM Considerations within CICS • Optimizing VSAM • Alternate index • Shared resources • Recovery

VA-31 Feb 2-6

VSAM

COBOL Coding for VSAM

VC-34 Feb 9-11

- Load, read, extend, update key-sequenced file • Load, read, extend, update entry-sequence file • Processing via an alternate index (OS/VS)

VC-35 Feb 18-20

DATA BASE TECHNOLOGY

IMS/VS

Applications Programming DB

- Identify major functions of DL1 • Coding DL1 calls to retrieve, add, or delete data • Build segment search arguments

MB-14 Feb 2-4

MB-15 Feb 18-20

IMS/VS

Applications Programming DC

- Code the accessing of IO-PCB • Code accessing of input message with multiple segments • Routing output messages to alternate terminals

MC-18 Feb 5-6

MC-19 Feb 23-24

IMS

On-line Message Formatting (MFS)

- 3270 I/O message segmentation • Message input/output descriptions
- Device input/output formats

MF-08 Feb 23-25

MF-09 Feb 25-27

IMS

Data Base Design

MD-12 Send for schedule

INTERACTIVE PROGRAM DEVELOPMENT

TSO

Time Sharing Options

TS-3 Send for schedule

CMS

Conversational Monitor System

CM-4 Send for schedule

OPERATING SYSTEMS AND INTERFACE PROGRAMS

MVS

Multiple Virtual Systems Debugging

SD-2 Feb 25-27

For registration materials and further information on specific courses, circle appropriate course numbers on coupon and mail:

ompEd or Call COLLECT
(212) 921-8676

CompEd Technical Corporation, Inc.
1133 Avenue of the Americas
New York, N.Y. 10036

Yes, Please send me information and registration materials for the courses circled below.

CV-22	CV-23	CV-24	CM-02	CT-11	CD-13
VA-31	VC-34	VC-35	MB-14	MB-15	MC-18
MC-19	MF-08	MF-09	MD-12	TS-3	CM-4
					SD-2

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please send information on new course announcements and future schedules.

System to Speed Processing of Traffic Violations

Special to CW

SACRAMENTO, Calif. — The cost of prosecuting traffic safety violators in California is expected to drop with application of an integrated on-line/batch processing computer system to a new program of the state's Traffic Adjudication Board (TAB) here.

The program is expected to speed up processing of traffic law citations and allow enforcement agencies in the most populous state to impose fines and other penalties with more consistency. The mainframe-backed program will also allow hearings for suspected offenders to be held at more convenient times and places, a TAB spokesman said.

A Sperry Univac 90/80 system currently used by the California Depart-

ment of Motor Vehicles will implement TAB's plan. The 90/80 is said to represent an integration of on-line input and retrieval coupled with downstream batch processing.

The on-line programs handle such time-dependent transactions as driver-record retrieval, the spokesman noted, while the batch programs handle bulk processing of the more routine transactions.

State Department

The TAB is a new state department whose operations are overseen by a five-member statutory board appointed by the governor. The board establishes regulations for processing and holding hearings on traffic cases and for hearing appeals from motor-

ists.

Commenting on the new system, TAB executive director Tom Novi said that "the network of computer programs running off the Sperry Univac 90/80 processor very possibly represent the most sophisticated system of its kind in the world."

"For example, the 90/80 is currently programmed to automatically produce more than 50 'trouble-shooting' notices to TAB employees informing them of potential problems in the adjudication process from ticket issuance to final case disposition."

"Our expectation is that by maximizing the use of computer technology we will significantly reduce staffing requirements, enhance the convenience of motorists and still provide consis-

tent and fair treatment for all cited individuals," Novi stated.

"With our flexible two-tier processing environment, we can respond to the timeliness of real world data processing needs in a manner which maximizes overall systems efficiency," he added.

Program Features

Some features of the TAB program include:

- Traffic safety violations occurring within the project jurisdiction from Oct. 1, 1980 to July 1, 1984, will be processed and adjudicated administratively rather than in the courts.
- Maximum use will be made of computer technology and other modern information processing techniques to keep costs low.
- Motorists may schedule a contested hearing by mail with no arraignment necessary, thus eliminating the need for two appearances.
- Sanctions will be imposed according to a uniform sanction guide taking into consideration the driver's prior statewide driving record.
- An analysis of the program's costs and benefits will be made by independent expert evaluators.

The new procedures are expected to be less costly to administer than the current system since there will be no prosecution costs, no district attorney involved, no arrest warrants issued and fewer clerical support personnel will be required.

Police overtime costs should be reduced through automated scheduling of officer appearances. Salaries for traffic hearing officers will be substantially less than salaries of judges or traffic referees.

Other benefits will come from faster processing of citations — motorists may walk in immediately and receive a summary hearing without the citing officer present — and because drivers will only have to appear once to obtain a hearing.



BDS for your HP*

The BDS line printers are the best cost/effective answer for your Hewlett-Packard computer requirements. BDS offers a complete printer line of *High Quality, Latest Technology and Quick Delivery—30 days in most cases.*

The BDS printer systems, with speeds of 200–1800 LPM with Matrix, Band, Drum, and ChainTrain Technology afford you the diversification for your exact needs with savings of 30–50%!

BDS Controllers and Interfaces are system tested before shipping, thus assuring you trouble free installation. BDS supplies the printer, controller and cable, you simply plug into your HP system and go.

For more specifics from us we need some from you, please call BDS (415) 326-2115 or send us the coupon. It will be money and time well spent.

- DEC
 - PDP8
 - LSI-11
 - PDP-11
 - VAX-11/780
 - DEC 20
- BURROUGHS
 - B80/800
 - B1700 thru B7800
- DATA GENERAL
 - Nova
 - Eclipse
- ***HP**
 - *3000 SERIES 30, 33 SERIES
 - *3000, I, II, III SERIES
 - *250/300 SERIES
 - *1000, 21 MX SERIES
- IBM—SERIES 1
- HONEYWELL
- TI - INTERDATA
- and most others

(the following companies all have registered trademarks)

CW 1/26/81

To: **BDS Computer Corporation**
1120 Crane Street
Menlo Park, CA 94025
(415) 326-2115
TWX 9103732005 (BDS MNPK)

The Computer System I Use _____

Name _____

Title _____

Company _____

Street _____

City _____ State _____ Zip _____

Telephone () _____ Ext. _____



HOW TO SUPPLY YOUR BUSINESS WITH TECHNICAL TALENT THROUGH GOVERNMENT FUNDING and more....

CETA For Your Business will tell you how to properly acquire and run effective CETA programs amounting to as much as \$250,000. Also, **WE WILL SHOW YOU HOW** your business **SHOULD:**

- GENERATE RENEWABLE CONTRACTS AVERAGING \$100,000 IN 30 DAYS
- ESTABLISH OR INCREASE CONSISTENT CASH FLOW
- INCREASE PROFIT FROM SALES (50 - 80%)
- OPEN NEW MARKETS FOR PRODUCTS

AND BENEFIT BY:

- REIMBURSEMENT FOR OVERHEAD EXPENSES
- OPENING OR INCREASING BANK LINES OF CREDIT
- ADDING NEW PROFIT CENTER
- ACQUIRING NEW TAX ADVANTAGES
- INCREASING QUALIFIED TECHNICAL TALENT

To begin, you must be decisive and act immediately!!!

Send your \$95.00 (TAX DEDUCTIBLE) investment by check or money order and receive this New-Sectioned detailed, step-by-step Publication. Guaranteed and PROVEN TO WORK!!

J & G INDUSTRIES, INC. P.O. Box 2069
Columbia, Maryland 21045
Allow 10 days for delivery

THE BROADEST LINE OF MINICOMPUTER STORAGE SYSTEMS IN THE WORLD.

DATUM MADE'EM.

Made 'em available to you. So that you can get the increased performance you've been looking for.

How many times have you wondered where you can get the kind of storage that would really enhance your computer performance? And how many times have you wondered why you couldn't get that from the original manufacturer?

Well, when it comes to minicomputer storage systems, you won't find a more reliable source than Datum.

WE'D LIKE YOU TO MEET OUR FAMILY.

One of the greater limitations of the minicomputer is memory capacity. That's because as a "smaller computer," the mini has very real limitations on the amount of resident memory. And that's why a company like Datum is dedicated to the development of reliable non-resident memory products. Our outstanding product family includes several standouts that make minicomputers more manageable.

Our clan includes controllers, drives and integrated systems. Our tape/disk controllers and tape/disk drives could make all the difference for your minicomputer. And they're compatible with DEC, Data General, HP, IBM Series 1, Interdata and Sperry Univac systems.

What's more, when you're in the market for minicomputer storage, you don't have to shop around, piecemeal. Because our family has it. All of it. We're price competitive and interested in doing volume business both large and small.

NOW MEET THE WHOLE FAMILY.

To tell the truth, there's more to our family than just product. There's people, too.

Our people provide you with excellent service from start to finish. From sales and application/technical support to on-site installation. And our maintenance program services all Datum products. Nobody serves you like the people from Datum.

WE MAKE TRANSPARENT CLAIMS.

Datum products are software transparent. That means, when you buy from Datum, your purchase will be totally compatible with your

present system. As well as your future system, should performance requirements change. And it won't require you to turn your operation upside down. There's no point in making a capital investment that won't cooperate.

In fact, Datum is the expert in minicomputer storage products. So when your computer system needs its performance increased, don't call a general practitioner. Call a specialist. Because we can diagnose your application requirements, prescribe a solution and come up with the cure better than just about anybody else.

But what's so unusual about that? After all we're specialists. The minicomputer storage specialists.

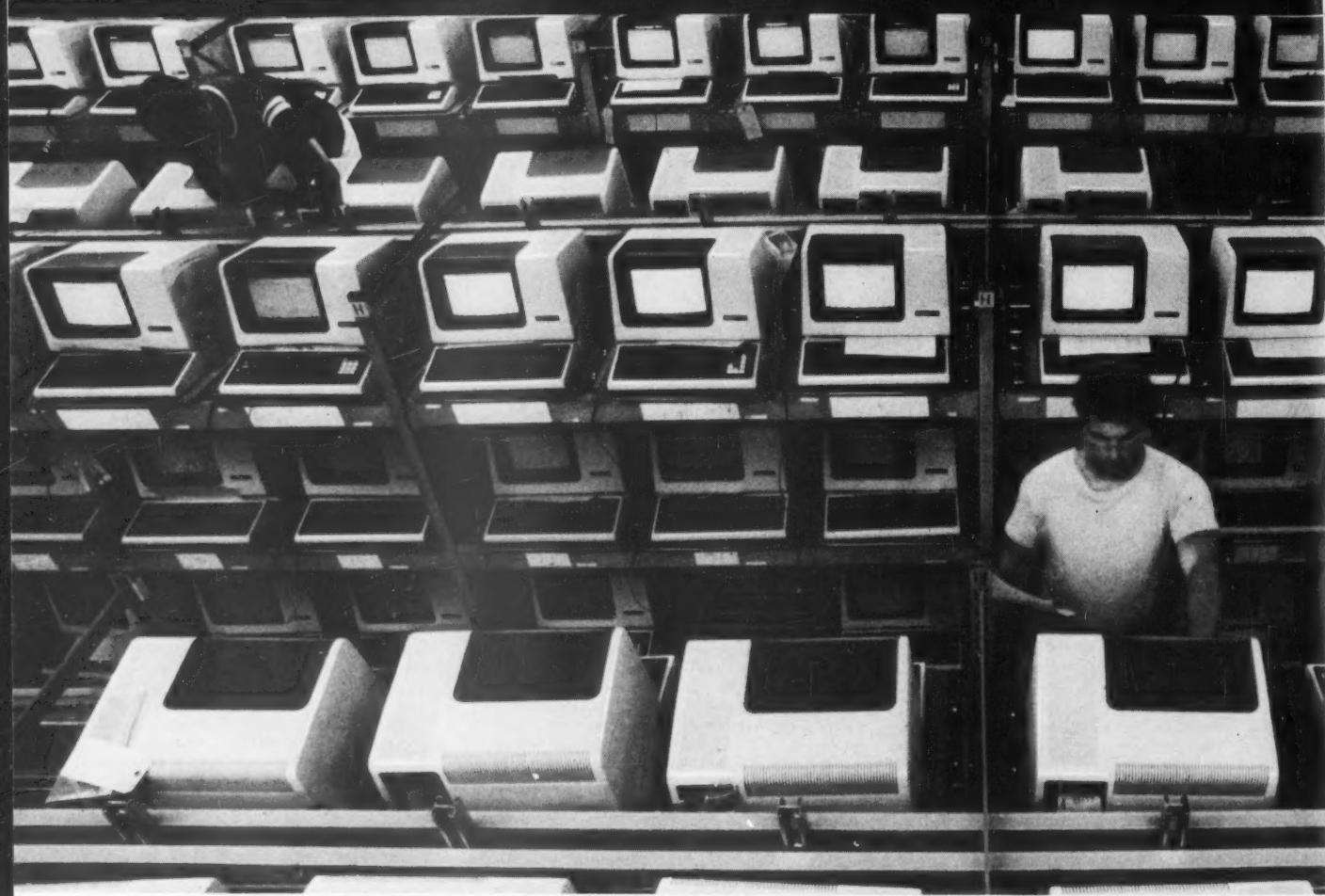
Why not call us today for a free checkup? Datum, Inc., Corporate Headquarters: 1363 South State College Blvd., Anaheim, California 92806. Telephone: (714) 533-6333, Ext. 207, TWX: (910) 592-1289, Telex: 68-5579.

Datum

Storage Systems Division



We just added an important new feature to our VT100.



Immediate delivery.

As of right now, your Digital terminals dealer has VT100 video display terminals in stock for immediate delivery.

Which means you no longer have to settle for something less than the original.

Of course it's easy to understand why demand for our VT100s has been outrunning supply. Look at all the features you get:

- Up to 132 characters per line.
- Double-width, double-height characters.
- Split screen and smooth scrolling.
- Normal and reverse video.
- Line drawing character set.
- Video input/output capability.
- Built in self-test diagnostics.
- Typewriter-like detachable keyboard.

And those are just a few of the basics. Even more impressive is the VT100's flexibility. And that comes from the way it was designed.

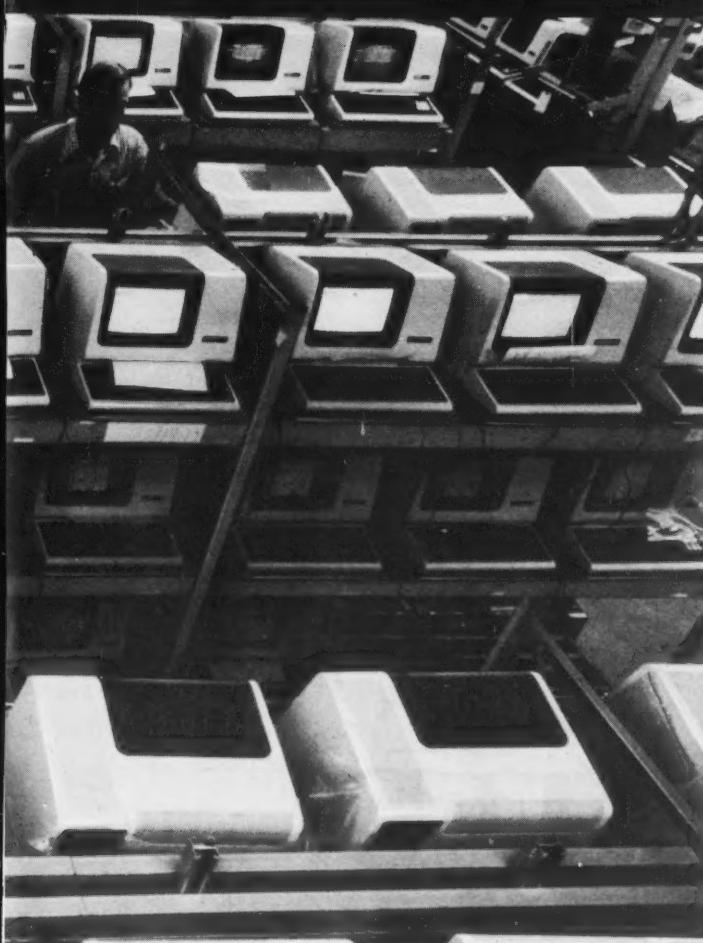
Instead of building the VT100 as just another display terminal we built in extra power and space to handle even customized OEM and end-user applications.

And if you need a terminal for asynchronous, block mode applications, we offer another member of the VT100 family—the VT132. It can operate either as a VT100 or in block mode employing all of the VT100 features for easy on-screen editing.

Digital's VT100.

It's one of the most popular display terminals ever made. And we're finally making enough.

Where to buy VT100s.



To buy your VT100s or VT132s contact your local terminals dealer. Or contact **Digital Equipment Corporation**, Terminals Product Group—MR2-2/M67, One Iron Way, Marlboro, MA 01752. Tel: (617) 467-7068. In Europe: 12 Av. des Morgines, CH-1213 Petit-Lancy/Geneva. In Canada: Digital Equipment of Canada, Ltd.

digital
We change the way
the world thinks.

ALABAMA

Huntsville
J.L. Highsmith & Co.
(205) 536-6666

ALASKA

Anchorage
Bagoy and Associates
(907) 274-8531

ARIZONA

Phoenix
Terminal Rentals, Inc.
(602) 258-4466

CALIFORNIA

Anaheim
Cal Data Lease Systems & Financial Corp.
(714) 632-6986

BURBANK

Electronet
(213) 843-3131

BURLINGAME

Business Systems
(415) 692-5711

CALIFORNIA

Redondo Beach
Consolidated Data Terminals, Inc.
(213) 970-0330

SACRAMENTO

Consolidated Data Terminals, Inc.
(916) 924-1644

SAN DIEGO

Data Systems Marketing
(800) 854-2684

SAN JOSE

Terminal Rentals, Inc.
(408) 292-9915

SAN MATEO

U.S. Instrument & Rentals
(415) 574-6006

SANTA CLARA

Continental Resources
(408) 727-9870

TUXTLA

Terminal Rentals, Inc.
(714) 832-2414

WEST LOS ANGELES

Carterfone Communications Corp.
(213) 879-1871

COLORADO

Denver
BFA Corporation
(303) 371-2422

CONNECTICUT

Milford
S & S Electronics
(203) 878-6809

WELLINGFORD

Computrend, Inc.
(203) 265-2841

FLORIDA

Orlando
J.L. Highsmith & Co.
(305) 293-5202

PENSACOLA

Digital Systems, Inc.
(904) 434-2685

TARPO SPRINGS

Data Rental/Sales, Inc.
(213) 559-3822

GEORGIA

Atlanta
Electronet
(404) 449-4800

ILLINOIS

Bensenville
Alanthus Data Communications Corp.
(312) 860-2233

MINNESOTA

Minneapolis/St. Paul
Computer Marketing Corp.
(612) 894-7150

MISSOURI

St. Louis
Marketing Corp.
(314) 434-3444

NEW JERSEY

Leaseameric
(415) 574-4441

NEW YORK

Blackwood
Data Access Systems
(609) 228-0700

OKLAHOMA

Oklahoma City
Tel-Tex, Inc.
(405) 947-3797

OREGON

Beaverton
Datec
(503) 641-6644

PENNSYLVANIA

Pittsburgh
C.G. Distributors
(412) 366-5056

SCRANTON

Scranton
Walsh Associates,
Inc.
(717) 346-3856

TEXAS

Addison
Data Applications
(214) 291-1100

WICHITA FALLS

Tano Corp.
(214) 681-1370

DALLAS

Carterfone Commu-

nations Corp.
(214) 350-1294

Fulton Business Systems
(214) 741-6785

Houston

Data Applications
(713) 686-8413

TEL-TEX

Tel-Tex, Inc.
(214) 231-8077

SAN ANTONIO

Data Applications
(512) 732-7176

VIRGINIA

Richmond
J.L. Highsmith & Co.
(804) 272-5888

WASHINGTON

Redmond
Consolidated Data Terminals, Inc.
(206) 883-0100

Seattle

Datec
(206) 575-1470

WISCONSIN

Milwaukee
Loonan Associates, Inc.
(414) 548-9790

Tele-Terminals
(800) 328-3072

CANADA - BRITISH COLUMBIA

Burnaby
Algo Communication Products, Ltd.
(604) 438-3333

CANADA - ONTARIO

Markham
Canterm Communications
(416) 495-5700

CES Electronic Systems Group Ltd.
(416) 495-5555

Lanpar Ltd.
(416) 495-9123

Teleterm Ltd.
(416) 495-5666

Mississauga Data Terminal Mart
(416) 677-0184

Toronto Hamilton Rentals
(416) 251-1166

CANADA - QUEBEC

Montreal Spectra Colour, Ltd.
(514) 739-2153

Telcor
(514) 337-6020

CANADA - MANITOBA

Winnipeg
Digital Systems Group, Ltd.
(204) 772-9411

CBC Services
(614) 222-5496

Mini Fine-Tunes Inventory For Stereo Components Firm

Special to CW

FRAMINGHAM, Mass. — When a manufacturer of stereo component equipment was looking for new ways to boost the accuracy of its inventory records, it found the answer right under its computerized nose.

Two-and-a-half years ago, Bose Corp. acquired a Hewlett-Packard Co. HP 3000 minicomputer and has been using it as a batch data collection machine and preprocessor to handle inventory and sales analysis data entry. The final data was then prepared by three separate service bureaus, according to Jim Dowling, the firm's DP manager.

However, since that time, the company gradually converted its fast-growing applications load to run in an on-line environment.

As a result of bringing its processing home, Bose has not only done away with the need for the service bureaus, but improved the accuracy of its inventory records by about 30%, Dowling claimed.

Time, Money Saver

"Converting some of our applications from batch to on-line meant a savings in both time and money," he said.

"As we began to do more work on the HP 3000, we dropped the service bureaus one by one until we were finally using the HP computer for inventory and order processing exclu-

sively."

Bose has been manufacturing stereo equipment for the past 15 years and supplies components to more than 200 dealerships worldwide. The company, based here, employs about 900 people, one-sixth of whom work in factories in Ireland and Puerto Rico.

The company's HP computer system initially consisted of five HP 2640 terminals tied to an HP 3000 with 50M bytes of disk storage and 128K bytes of main memory.

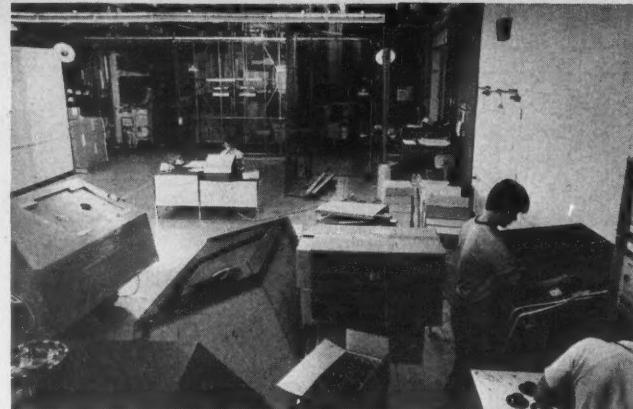
The terminals would do double-time, connecting Bose with IBM mainframes located at the service bureaus. Currently, the firm's headquarters has 34 terminals tied to a central HP 3000 Series III with 1M byte of memory and 420M bytes of storage.

During the dependency switch, Bose developed its own applications software, using Cobol as a programming language, and the HP Image/Query data base management system.

Tracking System

With the HP 3000, Bose has developed a materials tracking system, which keeps tabs on inventory beginning with the generation of requirements from a master production schedule through the creation of purchase orders, receipt of materials, stock transactions and cost analysis.

"We try to ship within five days. So, with that many systems to put together, it is necessary for us to be as



Since Bose Corp. purchased an HP 3000 system two and one-half years ago, payroll for 900 employees, inventory and sales analysis, accounts receivable and material requirements planning have been developed.

exact as possible in keeping up with what materials we have on hand, who has ordered what and the stage those orders are in," he said.

"Since we started using the HP 3000 for materials tracking, our accuracy rate has improved tremendously. In fact, a recent physical inventory showed less than 0.1% error on a \$2 million inventory."

Before switching on-line with the computer, Bose had a problem with inventory accuracy because of what Dowling termed "a lack of visibility." Without an on-line materials tracking feature, the previous system had difficulty pinpointing trouble areas. "Since going on-line with the HP computer," Dowling said, "we've been able to spot problems in our inventory before they

arise."

One of the major benefits the HP system has brought to Bose operation is timeliness, according to Dowling. He cited the generation of geographical sales reports as an example.

Under the old system, data on orders and sales were tabulated manually, and getting a geographical sales analysis into the hands of corporate directors could sometimes take as long as two weeks after a month-end closing.

As a result of the applications Bose has added with the HP 3000, a second system is scheduled to be installed this year.

This new system will be an HP 3000 Series 33 which will be used to develop the systems that will run on the larger Series III.

HOW TO GET PROMOTED

Don't let technology grow faster than you are. Attend one of Yourdon's five-day workshops to be held soon in a city near you.

Yourdon's in-depth workshops devote an entire week to a single discipline.

Much of the time is spent in workshops where the student applies and reappplies the techniques to realistic case studies. Participants gain expertise in a single discipline under the direct supervision and guidance of an experienced Yourdon staff member.

Structured Analysis and System Specification Workshop. This workshop brings order and rigor to the specification process to guide the analyst step-by-step in his development of a "structured specification."

Feb. 2-6 . . . Washington
Feb. 9-13 . . . Columbus
Feb. 16-20 . . . Vancouver
Feb. 23-27 . . . Toronto

Mar. 2-6 . . . Chicago
Mar. 9-13 . . . Los Angeles
Mar. 16-20 . . . Denver
Mar. 23-27 . . . Regina

Structured Design Workshop. This workshop familiarizes the participants with concepts such as module interrelationships.

Examples, exercises and a case study give practical experience using the new techniques.

Feb. 2-6 . . . Chicago Mar. 9-13 . . . Indianapolis

Feb. 9-13 . . . Baltimore Mar. 16-20 . . . New York

Feb. 23-27 . . . San Francisco Mar. 23-27 . . . Los Angeles

Structured Programming Workshop. Yourdon offers a Structured Programming Workshop and a Structured Programming Workshop in COBOL. Each teaches a broad range of techniques and skills for practical use by programmers.

Feb. 9-13 (COBOL) . . . New York
Mar. 16-20 . . . Chicago
Mar. 23-27 (COBOL) . . . Washington

Yes. Send me more information on
 Structured Analysis and System Specification
 Workshop
 Structured Design Workshop
 Structured Programming Workshop

Name _____

Organization _____

Title _____

Address _____

City _____

State _____

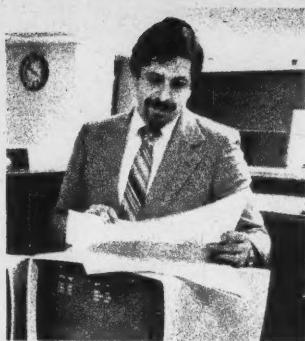
Zip _____

Telephone _____

YOURDON

1133 Ave. of the Americas, New York, NY 10036
Phone (212) 730-2670

In a hurry, call us toll-free at
800 223-2452



Michael Berman, Corporate Data Base Administrator

INCO LIMITED is a diversified company engaged principally in primary metals, formed metal products and electrical energy products.

At INCO, we demand adaptability and ease-of-use in our DBMS

ADABAS delivers!

Inco's DBA tells why ADABAS, Software AG's data base management system, was chosen for the expanding needs of this international firm.

"Five years ago, we chose ADABAS from Software AG as our data base management system. We demanded a highly flexible, end-user oriented DBMS. We also needed an easy-to-use package with the design phase already accomplished. Five years of experience have shown us we made the right decision in choosing ADABAS."

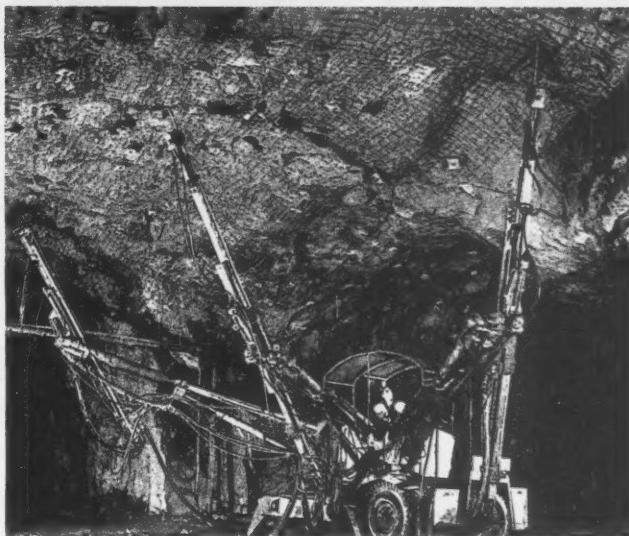


Exceptional flexibility, easy maintenance

"During the development stages of our many applications, the specifications often changed. We were constantly adding fields and files, or changing their locations in the data base. With ADABAS, these changes are very simple to make. There are no cumbersome chain pointers, so relationships can change according to need. In fact, we are continuing to modify our systems to meet our expanding corporate requirements."

Cost-effective new program development

"In planning new applications, we do not have to include the high cost overhead for restart/recovery, security, or data base loading. These utilities are all included in ADABAS already. Applications programming is faster and easier, too - because ADABAS provides the tools. ADABAS gave us a powerful end-user query language - ADASCIPT+, an interactive report generator - ADACOM, and an on-line Data Dictionary all in the same package. Furthermore, the ADABAS system can be fully installed in a single day!"



High company-wide productivity

"ADABAS is up and running at Inco 18 to 20 hours every working day. Our New York installation processes more than 400,000 data base commands daily. With all this intense activity ADABAS is supported by only three people."

ADABAS: Datapro Honor Roll winner for three years

Exceptional ease-of-use of ADABAS, combined with its outstanding throughput efficiency and adaptability, helped give this product such a high user rating that ADABAS has been nominated to the Datapro Honor Roll for three consecutive years. If you'd like to know more about how ADABAS met Inco's demand for a truly adaptable DBMS, send for Software AG's ONLINE report today. You may find that ADABAS is the ideal data base management system for a demanding company like yours, too.

SOFTWARE AG
OF NORTH AMERICA, INC.

Reston International Center
11800 Sunrise Valley Drive, Reston, VA 22091
(703) 860-5050

Please send me more information on ADABAS, including ONLINE, Software AG's special user report on INCO's success with this unique DBMS.

Title _____

Name _____

Company _____

Address _____

Telephone _____

City _____

State _____ Zip _____

Type of Computer _____

Operating System _____

A whole generation ahead

One brilliant idea created the Tandem NonStop™ System. Eliminate the "single points of failure" throughout the system and the system will stay up and running through a failure which would shut down any other system on the market today.

The design objective was unique even among distributed processing systems: that no single component failure anywhere in the system would shut a Tandem NonStop™ System down. Not in a disc or disc controller. Not in an I/O bus or I/O controller. Not even in a processor itself.

The idea sounded simple enough, but it meant questioning and often redesigning even the most elementary aspects of a system, right down to the cooling fans. Where fail-safe systems had traditionally been thought of in terms of having a standby second processor, Tandem perceived that in order to be truly fault-tolerant, a system had to integrate NonStop™ operation into every one of its vital parts: hardware, software, communications, support, and expansion. And to be commercially viable, there had to be no idle backups — every component had to be available for actual work. Perhaps most critical of all, there had to be NonStop™ protection of data and the integrity of the data base.

It took one brilliant idea to create the Tandem NonStop™ System, but it took hundreds more to implement it. And still more to produce it. The end result is the first commercially available NonStop™ on-line distributed processing system. It is a transaction oriented, high volume, high efficiency, high throughput system. And it features low cost per transaction plus thorough protection for data, programs and the data base.

This is how we did it. Key distinctions from the best of how it used to be:

NonStop™ architecture

The system was designed from the ground up with the intent that no single component failure would bring the system down.

We designed it with the certainty that errors or failures are bound to occur. Accordingly, we provide hardware and software which anticipates failures, checks for errors and deals with them.

NonStop™ hardware

Each critical physical resource, including communications paths, exists at least in duplicate. All interprocessor communications are handled by dual, extremely

fast bidirectional dedicated buses, increasing performance and reliability factors enormously.

Unique designs in power supplies and distribution assure continued operation even in brownout conditions, and ample power is retained by design to assure an orderly shutdown without loss or damage to data base or programs even in a total power loss situation.

System expansion is easy and economical. Start with only what you need and add processors, peripherals, communications facilities, storage or whole new sites in low cost increments. As your needs grow. Without penalty and without one cent of loss on your original investment.

NonStop™ software

Systems and packages which not only take advantage of NonStop™ capabilities but are essential to them.

NonStop™ operating system, designed from the start for multi-programming, multi-processor network operation. A true data base operating system, it provides full capability in even the smallest configuration. The system is expandable from two to sixteen processors in one location, each

in on-line processing

processor complete with its own copy of the operating system. Multiple locations are readily networked with as many as 255 systems in a network. Without change or modification to any of the original applications programs. Transparent access and geographical independence make NonStop® operation possible and expansion incredibly easy.

NonStop™ DBMS. Designed to take advantage of the NonStop® capabilities of the system; designed from the ground up to provide speed, efficiency, and ease of use with all the benefits of relational structure. Disc data structures that minimize head movement, the most frequently used disc blocks cached in main memory, and optional dual "mirrored" storage enhance throughput and speed. Relational structure allows flexibility and transparent operation.

Our DBMS includes automatic backout and recovery of any transaction in process if it cannot be 100% completed. From anywhere in the system or network. Without cost-killing overhead. This is essential for data base consistency. No one else has it.

We provide the development tools and facilities to make on-line as easy to program as batch, handling all terminal inter-

face functions, all screen formatting and sequencing, data validation tasks, and all internal communications using the industry standard languages you've been working with all along.

Our Query Report Writer is a model of simplicity, efficiency, and ease-of-use. A simple, English-like language replaces 90% of report programs. Reports and inquiries can be handled from anywhere in the system or network, and tailored at will, without having to rewrite programs or restructure the data base.

Our DBMS has many more features, but above all, it permits the writing of on-line distributed processing programs as simple batch-like applications modules.

NonStop™ network

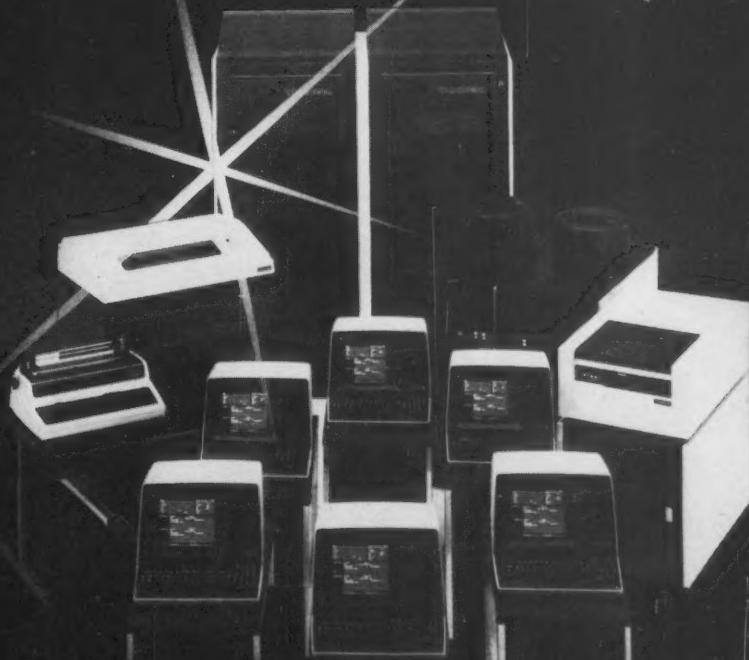
You can't have a NonStop™ network without a NonStop™ System. A true distributed processing NonStop™ network is easy for us since even the simplest of our systems is already a fully distributed NonStop™ System. Every feature you need in a worldwide distributed network occurs in even a minimum two processor Tandem system. Rerouting, when required, is both automatic and invisible to the user. Pass-through packet switching and best-path

routing are built-in. The Tandem NonStop® network allows you to modify your system or expand as you need to, adding peripherals, programs, processors, even whole new locations or nodes at will. All without having to reprogram or reconfigure the system.

Additional installments in this series explore single aspects of the Tandem NonStop® System in greater detail. Meanwhile, we welcome your interest and your inquiry. Call or write for complete information. Tandem Computers Incorporated, 19333 Valco Parkway, Cupertino, California 95014 USA. Offices throughout the U.S.A., Canada, Europe, United Kingdom, Mexico and Japan. Distributors in Australia, Finland, Greece, Korea and South America.

**TOLL FREE: 800-538-3107 or
(408) 725-6000 in California**

TANDEM
NonStop™ Systems



1200 BAUD TELEPRINTER

- Ready to deliver
- Priced competitively
- New nine-needle print head
- Interfaces for all popular systems
- Selectable baud rates and line protocols
- 42 programmable functions



MANNESMANN TALLY

8301 S. 180th, Kent, WA 98031
Phone (206) 251-5524

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____
PHONE _____

The DEC Connection

When your terminals need cables
Call us today and we'll ship tomorrow
Any cable, any length

BC 03R, BC 11S, BC 22A, BC 22B, BC 01V, BC 05C,
BC 05D, BC 03M, BC 03L, BC 21A, BC 21B, and more.

Or your cables need terminals

VT100-AA	LA34-AA	LA120-AA
LA120-BA	LA38	LA120-RA
all options		

Or your computer needs communications.

- Codex Modems
- Codex Multiplexers
- Acoustic Couplers
- Short Haul Modems
- Unterminated Bulk Cable
- Connectors/Strain Reliefs
- Interface Monitor
- Continuity Tester

Call Our
Hotline



800
323-7385

TEL COM PRODUCTS, INC.
107 W. 61st STREET/WESTMONT, ILLINOIS 60559

In Illinois call 312/960-4090



Applications Software Lets Trucking Firm Drive Away With \$3.5 Million Savings

DENVER — Savings of nearly \$3.5 million from applications software?

That's the "conservative" estimated figure resulting from BN Transport, Inc.'s (BNT) implementation of IBM's Freight Equipment Reporting System for Transportation/Virtual System (Ferst/VS).

The regional carrier, a subsidiary of Burlington Northern with some 23,000 route miles covering 16 states, installed all four Ferst modules — message switching, equipment control, overhead freight billing and rating — early in 1980 to replace a combination of on-line, batch and manual systems.

"Ferst is a telecommunications system, designed specifically for the trucking industry," President Charles A. McGee explained. "It provides us with the most effective tools and current information available for management control. The end results include lower costs, greater efficiency in operations and improved profits."

Savings Figures

BNT "started the clock" on Ferst for financial analysis purposes more than 11 months before the system went on the air. Although firm figures are not available, the break-even point was expected in the third quarter of 1980 and the annual net cash flow before taxes was projected at \$600,000. This year cash flow before taxes should exceed \$800,000, in 1982 it should top \$1 million and in 1983 estimates are for over \$1.3 million, according to a BNT spokesman.

"The savings figures are quite conservative, and we have verified them with at least two levels of management in all cases," said C.L. Luetger, vice-president of administration. "They don't include any 'funny money' — not an hour here and an hour there which don't realistically add up to savings."

"Nor do they include substantial 'cost avoidances' we are already achieving in equipment control," Luetger said.

Overhead freight billing information is entered into the system via IBM 3767 communications terminals in 31 out of 39 truck terminals. They are linked to an IBM 370/145 in Denver so the information becomes immediately available for multiple uses. Editing, routing and reporting have become a unified function that reduces operating costs by streamlining processing. This year billing labor savings will top \$116,000, and projections indicate more than \$200,000 in 1983, BNT said.

Full-time raters in Denver key data into seven 3278 CRT terminals, averaging 50 bills per hour compared to a peak of 30 bills per hour in the past, according to a BNT spokesman.

Control is also increased because data on the status of each shipment is available to authorized persons anywhere in the system. Savings in tracing costs are in the \$240,000 range this year and may top \$400,000 in 1983, he said. Management reports are available on a more timely basis — at estimated savings of nearly \$300,000 this year, and over \$500,000 in 1983, he said.

However, management personnel agree that the biggest reporting savings are from the effects of improved reports — more data, more quickly and accurately available, in the most usable form.

Equipment Control

BNT is also realizing major savings in equipment control. At the close of 1979, the combined city and line-haul fleet numbered 515 tractors, 1182 trailers and 52 trucks. By the end of 1980 about 50% of the trailers were expected to be parked because Ferst allows the firm to plan equipment use with greater flexibility and efficiency.

"When we put in Ferst, our line-haul tractor-to-trailer ratio was one-to-six. It is now nearing one-to-three," said Gary R. Morgan, director of transportation. "Each day we randomly pull equipment utilization reports on the truck terminals, check on idle or excess equipment and park if. We already have over 35% parked and will use the equipment only for emergency or replacement purposes," he said.

"Originally, we expected to spend about \$3 million this year for new equipment, but we'll spend only about \$1 million. And this hold-down on equipment will continue. Consequently, if business volume continues about the same, we estimate we'll also save from 25% to 30% on maintenance and fuel," Morgan continued.

"I was brought up in an old-time trucking operation with manual systems. And other computer systems I've worked with often had confusing coding," L.E. Marek, area manager, said. "So I was expecting the worst with Ferst."

But, "somebody who knew something about trucking wrote this program because the codings we key into the terminal are so easy to understand," he said.

"It not only helps locate lost freight within 48 hours, it also helps pinpoint a destroyed bill and stolen freight," Marek said. "This greatly increases security and customer service, compared to past procedures where it sometimes used to be weeks before a problem could be traced."

"Ferst accepts no mistakes — the input must be accurate and if we attempt to enter an error, the computer tells us right away in understandable English," Marek said. "It keeps everybody in the [truck] terminal accurately informed."

BNT implemented Ferst via a planned project management approach in cooperation with an IBM Application Transfer Team (ATT), said Luetger.

"We installed the 768K-byte 145 on Aug. 1, 1979 and began working on the Ferst programs in mid-September. We had six programmers before we started and our original proposal called for adding another two, but we only had to add one," Jens Nielsen, director of systems and DP, recalled.

"Despite the fact that we went on it 'cold turkey,' our problems were minor and what little debugging was necessary we were able to handle in slack times," Luetger noted.

NEW ADD-IN MEMORIES FOR NOVA⁺ & ECLIPSE⁺ COMPUTERS.

Add-in confidence
with optional
on-board ECC
and diagnostics.

MOSTEK

Think of the added confidence that on-board ECC and diagnostics can give you. For NOVA 4/X & 4/S minicomputers, our fully compatible MK8018 memory system features an on-board single-bit error correction option complemented by an 8 LED error log display. With it, you can troubleshoot to the individual RAM level.

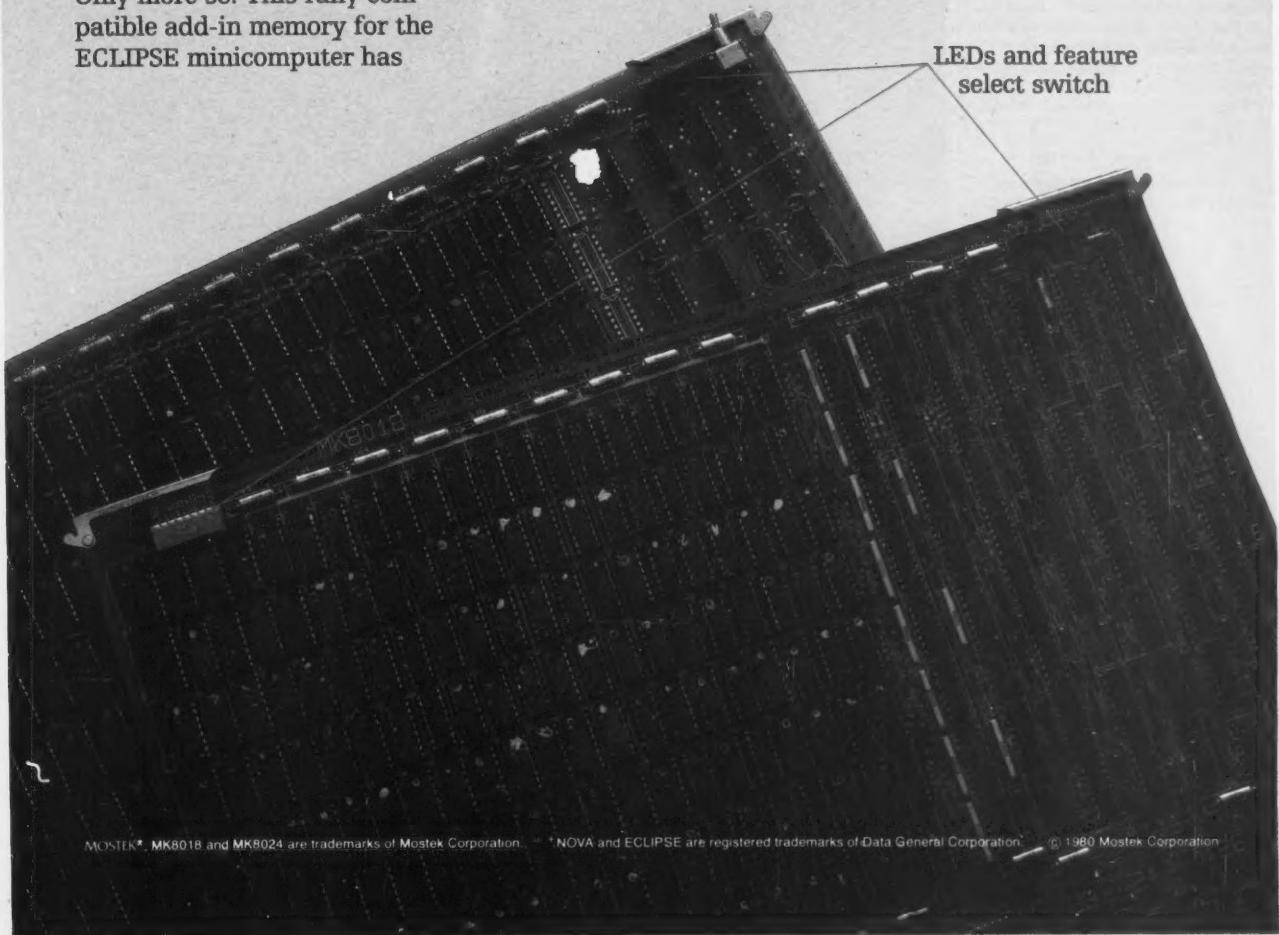
The same is true with our MK8024 memory system. Only more so. This fully compatible add-in memory for the ECLIPSE minicomputer has

three ECC options. One of which includes single-bit error correction that is independent of and transparent to the processor.

Using industry-standard Mostek dynamic RAMs, memory configurations for the MK8018 range from 32K \times 16/21 up to 128K \times 16/21. For the MK8024, choose from 16K \times 16/21/22 up to 128K \times 16/21/22.

Call your Mostek regional sales office for more details.
Northeast: 617/256-1500
East and South: 201/842-5100
North Central: 612/935-4020
South Central: 214/386-9141
Western: 714/549-0397
Northwestern: 408/287-5081

Or contact Mostek Corporation, 1215 West Crosby Road, Carrollton, Texas 75006, (214) 323-1802. In Europe, contact Mostek Brussels 660.69.24.



CPU Slates 99% of Classes Schools Solve Custom Scheduling Problem

ANNAPOLIS, Md. — When IBM's 360 scheduler proved inadequate to the needs of the Anne Arundel County school district, Ernest M. Clayton Jr. went to an Association for Educational Data Systems (Aeds) conference to review available applications packages for secondary school scheduling.

"We have some 40,000 students in our county's 29 secondary schools," he pointed out. "And I don't think any two of the schools had the exact same requirements. Each school had different considerations, the most important of which was the various grade combinations in the schools — anywhere from sixth and seventh grade in one school, seventh through 12th in another and 10th to 12th in a third," he said.

The answer was to find a framework for a system that could be adapted by each school, he said.

The IBM package that was being used was the old 360 scheduler, he recalled. It was oriented to traditional college arena-type scheduling, and it required an inordinate amount of in-house rewriting just to get by, he said, adding, "it wasn't adequate for current needs and growth."

Every package discussed at the conference would have meant a compromise in the district's goals, he said.

"We were told that if we would acquire more hardware, there was a software package just right for us. As it is, we have limited internal staff to handle our district's [systems]," he noted.

And Clayton did not want to utilize an outside service bureau where he would be adding unbudgeted costs because of the large number of students without maximizing the installed Model 138's available time.

'MacSocrates' Package

In 1979, he finally learned of a variation of IBM's Socrates school scheduling package being used in a service center environment for a number of nearby Pennsylvania and New Jersey schools.

The service bureau was an operating group of Management and Computer Services, Inc., Macs, offering the necessary capabilities.

And, the MacSocrates package included on-site support of the individual schools and school districts using the software during the first phase of the scheduling program, Clayton said. IBM was not willing to provide its support, he said.

"We asked if the MacSocrates system would be available for lease to us with certain enhancements since the combination of that software with the JCLMacs package seemed to answer our needs," Clayton said. The software firm realized it could gain a return on its investment in Socrates modifications and enter a new market area by applying the modifications to the IBM-leased package.

Since Socrates is a proprietary package, Clayton leased the software from IBM and put it on a figurative shelf, based on advice from Macs. The modified package was then installed on the Anne Arundel computer and IBM gained a user it was not in a position to support, according to Clayton.

The package supplied capabilities not offered by IBM and helped record a

94% schedule for the first school, Virginia Myers, administrative manager at Howard county, said.

"Macs' greatest value is as liaison between the schools and the DP office. [The vendor] understands the people problems associated with scheduling and can explain the problems in terms the principals understand," she said.

Efficient Matching

"Scheduling is not just putting students in classes and placing a teacher in charge," Clayton explained. "Budget requirements demand efficient matching of students with classes, teachers, facilities and available time periods so that school resources are

employed most efficiently."

"The people from Macs had enough experience with secondary schools so that they were able to train our people, stay with them and offer advice as needed and help us start assembling a master schedule," he said.

"We were able to build a master schedule that encompassed room, teacher and course limitations and gave us the ability to override a restricted schedule as needed."

The second Maryland Macs user provided scheduling for seven schools in Charles and St. Mary's counties with the package, according to Harriett Merritt, an administrator in Charles

County.

"One school scheduled 1,395 of 1,400 students with MacSocrates while five others did better than 90%," he said. Future plans include "adding grade reporting, resource allocation and other information areas" to the system.

"The software allowed us to perform scheduling under a wide range of alternatives: student priority scheduling and course priority scheduling, student-selected alternate courses as well as schoolwide alternate courses, scheduling restrictions by sex, grade, ability and location and other areas such as homeroom and study hall assignments and class balancing," he noted.



Packet Net Gives Hospitals Remote Diagnoses

HOUSTON — Doctors at remote hospitals who rely on Houston Methodist Hospital's pulmonary diagnostic capabilities have saved time and money by switching from the mails or long-distance dial-up communication to a public packet communications network.

The 15 remote users of the system — as far away as Carlsbad and Hobbs, N.M. — take advantage of the program and data base developed a decade ago by Houston Methodist, a leading center for the treatment of pulmonary disease.

Supplied with test data, the program compares the results to normal pulmonary functions, displays data graphically and in tables and prints out an interpretation and summary based on

historical records.

The attending physician interprets the diagnostics according to the history and symptoms of the particular patient.

"The doctor retains control of the data and its interpretation, and of the patient," stressed Karen E. King, technical director of the hospital's pulmonary physiology lab and head of its medical communications network. The physician must countersign each computer interpretation before it can be implemented.

The system supports all levels of testing from a simple measure of the amount of air reaching the lungs and blood gas tests to complete pulmonary profiles.

The data is entered via a keyboard

terminal, and an IBM 370 monitors all entries for gross inaccuracies, rejecting obvious errors. This part of the process can be performed by clerical personnel, saving physician and technician time, King explained.

As soon as the data entry is complete, the program prints out a chart of the results and an interpretation. Data is kept on disk for three months for immediate recall, then is transferred to tape archives that are available on request.

The system is totally transparent to the user, though Houston Methodist Hospital can call up the data for consultation purposes if the attending physicians request this service. Data can be entered over any 300 bit/sec Ascii terminal. All revisions to the pro-

gram are available at no extra charge to outside users.

Modifications, in fact, are mainly due to user feedback from both inside and outside the Houston center. The Methodist Hospital pulmonary lab records how often an opinion must be added to a study to make it relevant to a particular set of data; the opinions are added by the attending physician.

"If we see a base pattern needing addenda frequently, that tells us that we need another branch of logic," King noted.

Service Expansion

The pulmonary program was first made available to other Texas hospitals over intrastate Wats lines. When out-of-state hospitals expressed an interest in joining the network, King began looking for alternatives.

"Staying with the phone company meant using out-of-state Wats, which would have increased costs significantly," she explained.

The network services offered by Tymnet, Inc., however, seemed made to order, she indicated, since "all of our data is transmitted digitally, and Tymnet has a nationwide distribution, charges less than the phone company, and gives good accountability."

Tymnet tracks network use and each month sends the hospital a tape showing how long each user has been online.

Tymnet charges are based on the volume of data characters transmitted and a time charge; Houston Methodist Hospital passes these costs on to its customers, and charges a flat rate for each test: from \$1.50 for a simple blood gas report to a peak of \$8.50 for the most complex pulmonary profile.

HP3000 USERS: FREE PAINT OFFER.

Hewlett-Packard is a computer company that also makes disk drives. If you own an HP computer, say the 3000, you know just how good it is. And if you want drives with the same brand name, right off the shelf, then you know that HP's drives, such as their 7925s, will make a pleasant and color coordinated match. But here's something you may not know: the best drives to attach to your HP3000 are not made by HP.

DON'T COMPROMISE, SPECIALIZE.

We are United Peripherals, a new company founded on the proposition that some folks do certain things better than others—and that few folks do all things better than anyone else, particularly when it comes to computer peripherals. Sure, HP can offer you the same name on the console, and the same color. But when it comes to performance and capacity, when it comes to space savings and cost savings that are so critical today, you should go to the folks who don't think of drives and controllers as "convenience" items, as profitable incidentals. You should go to folks who specialize, who innovate in those areas because their very existence depends on it.

COMPANIES LIKE CDC, MICROCOMPUTER SYSTEMS, AND UP.

Let's start with us, UP. We put peripheral systems together, utilizing the best components and attaching them to the finest minicomputers. Because we are directly affiliated with Microcomputer Systems Corporation, finding the specialist in disk drive controllers was simple enough. MSC has shipped more controllers than any manufacturer in the industry. As for disk drives, you don't have to look any further for a specialist than CDC, another Number One company. Bringing all of the elements together into a superior system is the job of UP. Our credentials follow.

THE UP1696. SUPERIOR BY ANY MEASURE, EXCEPT MAYBE COLOR MATCH.

Our UP1696, featuring the powerful 600-mb CDC 9775 and the sophisticated MSC 1696 controller, opens up a whole new world of possibilities for HP3000 users. First, capacity. The UP1696 is command set and software transparent to the HP3000. To the computer, it actually looks like four 120-mb HP7925s. So, instead of the maximum

capacity of 980 mb possible with HP, you can expand, at your own pace, to 3840 mb with eight of our drives.

Beyond capacity, and largely because of it, the UP1696 opens up a world of savings as well. For instance, 40% savings on disk drive costs, when you evaluate on the critical dollar-per-megabyte scale. And up to 75% on floor space, because the UP1696 features four times the density of HP disk systems. And today particularly, floor space is just another word for dollars.

MORE RELIABLE, MORE MAINTAINABLE, AND FULLY SUPPORTED.

If there were any advantage in HP3000 users going with HP drives, it would seem to be in the area of service. One name, one place to call in case of problems, right? Well, it's no different with UP. One call to us puts any service problem into one set of very capable hands. Ours. No wrangles. No buck passing.

However, there'll be a lot less service to be concerned about, because the UP1696 is simply more reliable and more maintainable. Because the drive is a superior, state-of-the-art product. And the controller, with its low parts count and quality components throughout, means there is less to go wrong. Beyond that, software diagnostics as well as micro-diagnostics insure rapid isolation of problems that do occur.

ABOUT THE FREE PAINT OFFER.

So, okay. If after we've put together a better system to attach to your HP3000, one that delivers more capacity, better overall performance, for less money and in less space, you still want the colors to match, you've got it. We'll send the painter out.

But you'll have to call first.



united peripherals

432 Lakeside Drive, Sunnyvale, CA 94086
(408) 730-4440

TIME OUT

Take a moment to consider your goals. Where you've been and where you're going. If it seems you've achieved as much as you can in your current position, perhaps it's time you went into business for yourself. Time to take control of your future, time to be satisfied. At MicroAge, we've had years of experience in the retailing of small business computers. If you're interested in cashing in on the explosive market for small business computers, call us today. We may have just the thing for you. A MicroAge Computer Store.

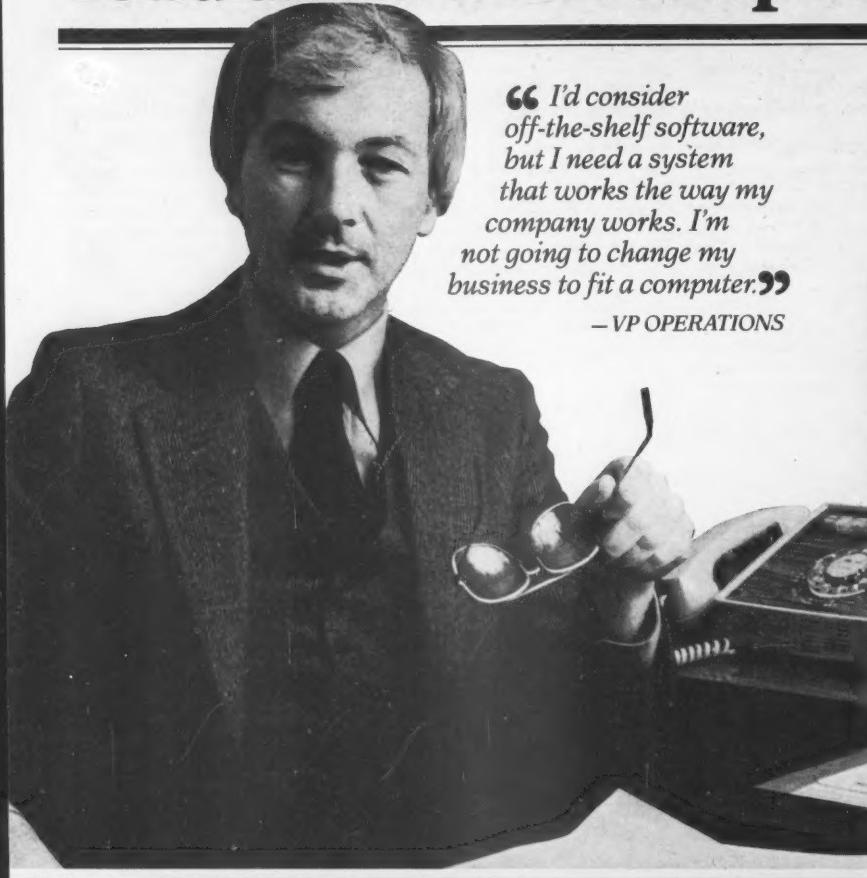
To receive a complete Franchise Information Kit, contact our Director of Franchising now.

Call: (602) 967-1421

MicroAge Computer Stores, Inc.
1425 W. 12th Place
Tempe, AZ 85281

MicroAge.
COMPUTER STORE
A FRANCHISE OPPORTUNITY.

You'd think we developed our materials

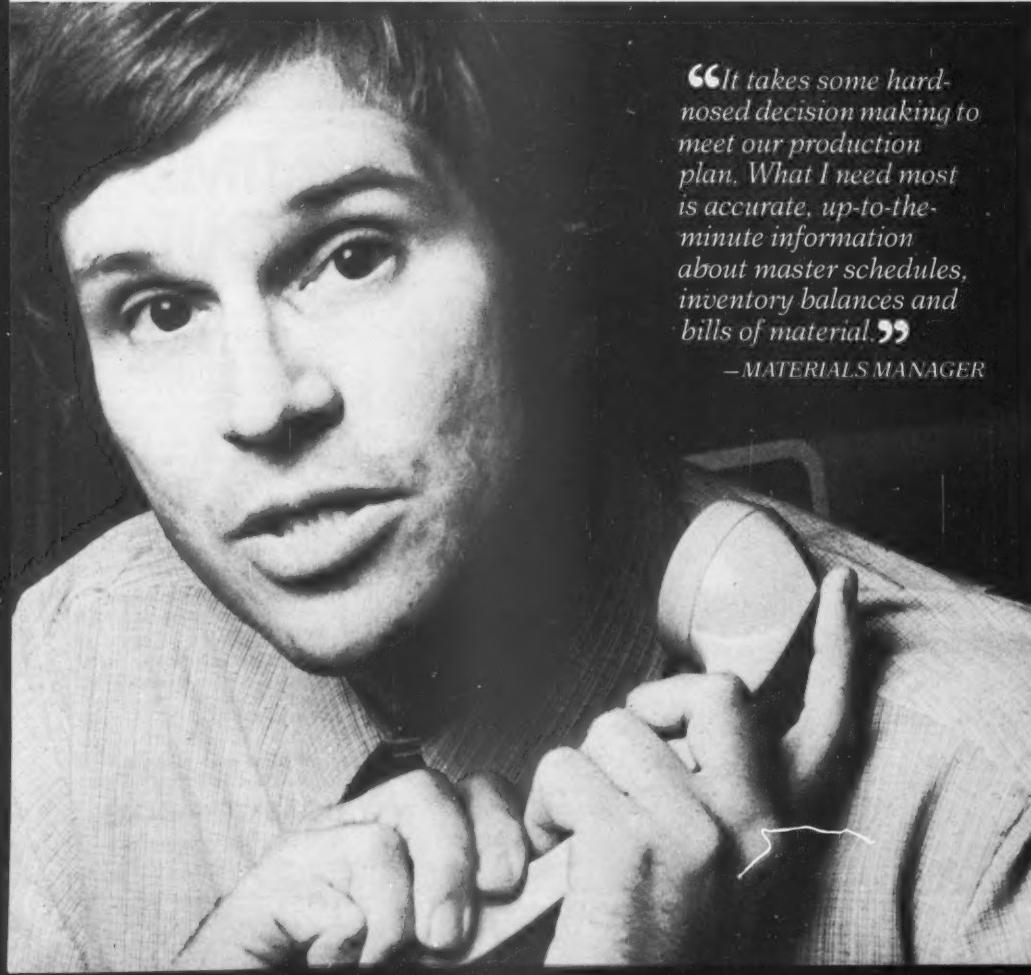


“I’d consider off-the-shelf software, but I need a system that works the way my company works. I’m not going to change my business to fit a computer.”

—VP OPERATIONS

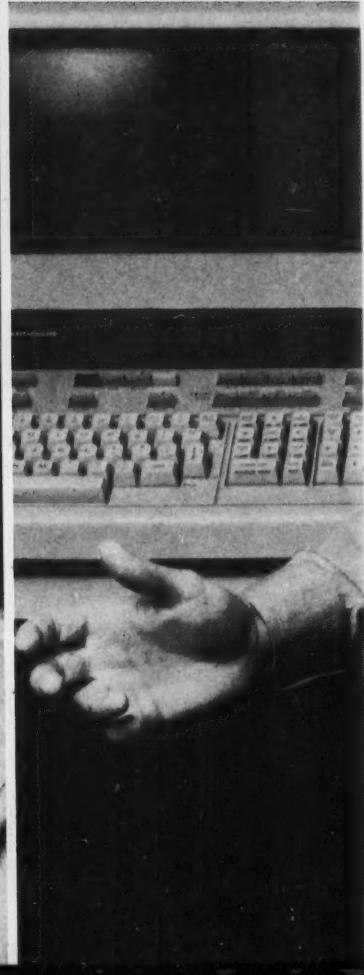
“All I can say is that the system better be easy to use. Here in the stockroom, we don’t have time to become computer experts.”

—STOCKROOM MANAGER



“It takes some hard-nosed decision making to meet our production plan. What I need most is accurate, up-to-the-minute information about master schedules, inventory balances and bills of material.”

—MATERIALS MANAGER



management system just for you.

At last there's a new approach to application software for manufacturing—a materials management system that you can tailor to fit your company's needs. Without programming. And with continued support from Hewlett-Packard.

We call it Materials Management/3000.

Designed to run on our powerful HP3000 computer, Materials Management/3000 gives you the information you need to help reduce your inventory investment and still meet your delivery schedules.

Customize as you go.

Materials Management/3000 comes ready to run. So you won't



have the headaches of a long, costly implementation process. But it's also easy to customize to fit more closely the way you work.

With a simple "fill-in-the-blanks" approach, your staff can define the kinds of information you'll need and determine the best ways to present it; set up data entry forms like the ones your people are used to using; establish security levels; and change any of these at any time to keep up with the growth of your business.

What's more, Materials Management/3000 is online and interactive, so your information is always accurate and up-to-the-minute. And it's available with just a few simple keystrokes whenever you need it.

The building blocks for building products.

Ten separate modules work together to give you a firm handle on your materials plan. You can monitor purchase and work orders, as well as materials issues and receipts. The Master Production Scheduling module lets you simulate new plans before implementing them. Rough Cut Resource Planning helps you spot critical resource problems early. And the MRP module pulls it all together to generate the plan for ordering all parts and material.

A partner in productivity.

HP manufacturing specialists will work with you right from the start to help you plan your Materials Management/3000 system. And even after you've customized it, they can continue to give you full support and service, as well as the latest software enhancements.

If you'd like to see Materials Management/3000 in action, just contact your local HP sales office listed in the White Pages. Or write for more information to Hewlett-Packard, Attn: Rich Zalisk, Dept. 374, 11000 Wolfe Road, Cupertino CA 95014.

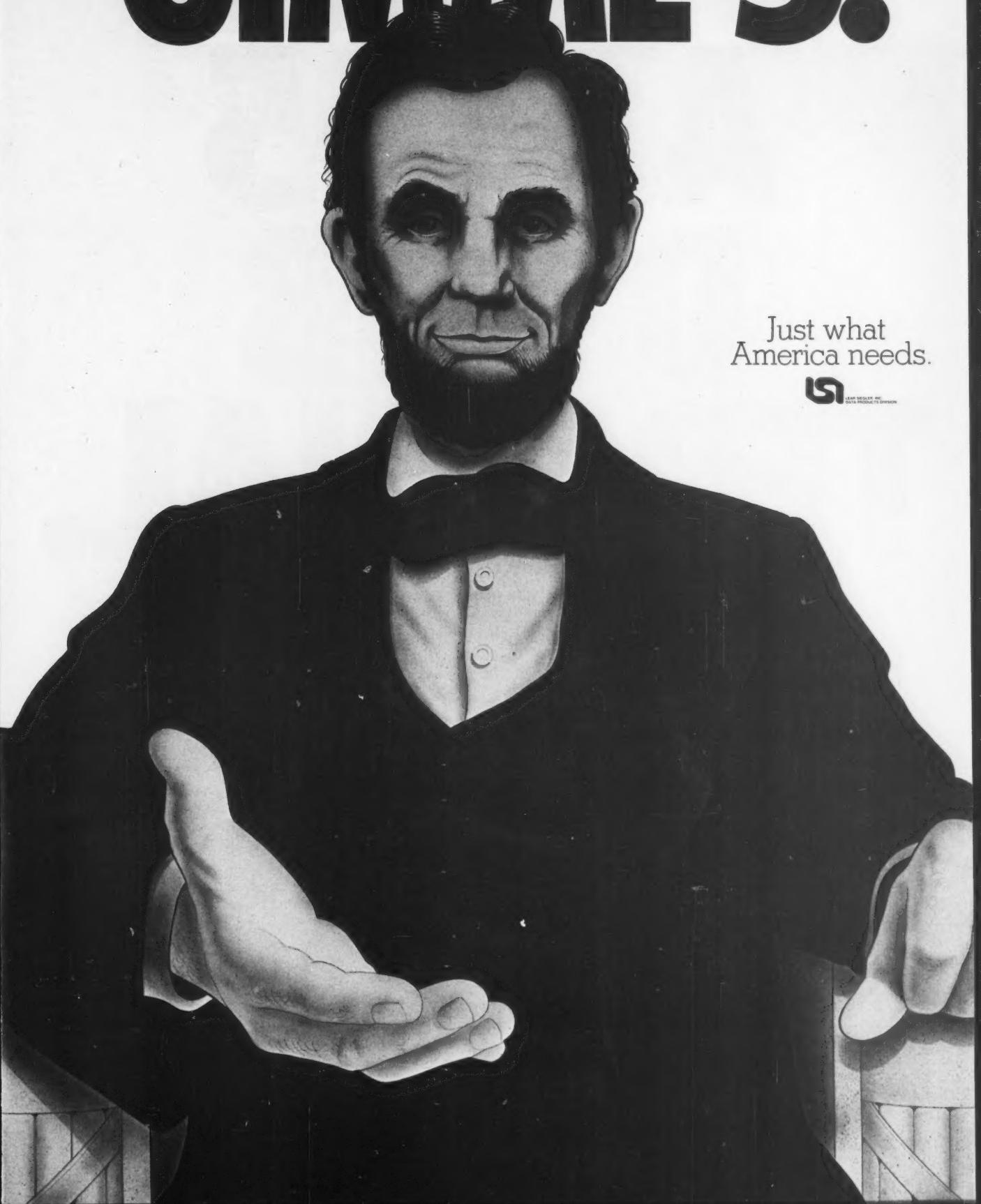


**HEWLETT
PACKARD**

“Developing your own in-house materials system is one alternative, but it's an extremely lengthy, and costly, proposition. I need a system now, and one that won't tie up my programming staff.”

—EDP MANAGER

"GIMME 5!"



Just what
America needs.



LEAR SIEGLER, INC.
DATA PRODUCTS DIVISION

THE NEW ADM-5 DUMB TERMINAL.





The new ADM-5 Dumb Terminal® video display from Lear Siegler is the latest addition to a great American tradition. A tradition that has consistently delivered data terminals of the highest caliber. Not the least of which is our Dumb Terminal series. And now, Lear Siegler brings you a totally new Dumb Terminal with visual attributes and limited editing.

The ADM-5 is human engineered to provide all the performance you'd normally expect in a conversational terminal. Plus just the right combination of operator conveniences and capabilities typically found only in

THE LATEST ADDITION TO A GREAT AMERICAN TRADITION.

more expensive editing terminals.

Conveniences that make it easy on the operator. Reduce input errors. And increase all-around efficiency and throughput. Plus special added capabilities for those handy performance extras — without the added price.

The ADM-5 is a great new general purpose terminal made right here in the good old USA. And is designed to suit the majority of applications. And the price will suit you too. Only \$995. (Quantity 1).

At Lear Siegler, we're keeping alive a tradition of excellence. And that's American as apple pie.



LEAR SIEGLER, INC.
DATA PRODUCTS DIVISION

Lear Siegler, Inc./Data Products Division, 714 North Brookhurst Street, Anaheim, CA 92803 800/854-3805. In California 714/774-1010. TWX: 910-591-1157. Telex: 65-5444. Regional Sales Offices: San Francisco 408/263-0506 • Los Angeles 213/454-9941 • Chicago 312/279-5250 • Houston 713/780-2585 • Philadelphia 215/245-1520 • New York 212/594-6762 • Boston 617/423-1510 • Washington, D.C. 301/459-1826 • Orlando 305/869-1826 • England (04867) 80666

DP Dialogue

Notes and observations from IBM
that may prove of interest to
data processing professionals

Watertight Estimating on Fire Protection Systems

"With the help of our computer we're able to bid and close more jobs," says Bill Testa, Eastern division engineering manager for Grinnell Fire Protection Systems Company, Inc. "We get our complete hydraulic design and cost estimate in a matter of minutes instead of days, with accuracy that would be impossible for us to achieve manually."

Testa explains that some large facilities might need as many as 30 or 40 separate sprinkler systems, each having to meet different specifications such as water density and other design parameters. A small variation in pipe size might mean the difference

of thousands of dollars in a bid. Coming in too high could lose the contract. Too low a bid might well eat up the profits.



Grinnell engineers at 85 locations in the U.S., Canada and Mexico are online to an IBM 3031 Processor in the Providence, Rhode Island, headquarters of the company, a subsidiary of Tyco Laboratories, Inc. Using online terminals, they describe the basic devices needed such as piping, fittings, valves and sprinkler heads.

As Dennis Kozlowski, vice president-finance, explains it: "Through a program called PRICER, the 3031 prepares an estimate for a bid. It can prepare price estimates for products and contracts months and even years into the future using a constantly updated

data base of forecasted price escalations.

"Once the contract is signed, another program, which we call LISTER, is able to prepare a bill of materials that goes from any of our 85 locations directly to one of Grinnell's five plants in the United States. LISTER also provides due dates when the material is needed at a construction site and acts as a perpetual inventory system for over 10,000 parts."

"Our engineers like the idea of being online to a 3031," says Lou Chiesa, director of management information systems. "They don't have to wait to get the answers they need. In fact, we come close to 99 percent machine availability during the 24 hours a day that the computer is up."

"And we're expanding into computer graphics. Engineers at many of our locations can now key in the rough design information at their terminals and get back a complete alphanumeric line drawing of the system, showing all sprinkler locations and dimensions."

Grinnell was the first company in the industry to do all its hydraulic design and estimating by computer. Earl Page, president, feels that "the computer has helped us make full use of all our resources. It has been an important factor in our impressive growth."

"It's pure and simple," Testa adds. "In this day and age we couldn't get along without the computer."



A 175-quartzoid sprinkler is assembled at Grinnell's manufacturing plant in Lubbock, Texas. An IBM computer helps out in everything from designing and bidding to pricing and inventory control.

WIRS Wraps up 747 Wiring in a Neat Bundle

As a jet airliner is designed and built, the details of its electrical system undergo constant change. For the 747 jumbo jet, Boeing Commercial Airplane Company uses a computer to keep track of each piece of wire.

Since there are extensive wiring differences for different customers, and even among individual planes, Boeing uses interactive computing based on the IBM Information Management System/Virtual Storage (IMS/VS). This permits changes and variations to be entered immediately, as they arise, and allows engineering and manufacturing people to stay abreast of the configuration for each plane.

Running on an IBM 3033 Processor in Kent, Washington, the Wire Information and Release System (WIRS) stores the identity of each of 49,000 segments of wire in a 747, and its assignment to a bundle. Robert M. Beers, functional manager, WIRS, explains. Through the design, release, and fabrication of the bundle, WIRS identifies the device or connector at each end of the segment, the wire type and gauge, and the aircraft to which it applies. Data is added or changed by filling in blanks on the screen of a terminal in one of five plants in the Seattle area or the Boeing plant in Wichita, Kansas.

During an average week, 500 engineering change notices are entered against the wiring of the 747, affecting one plane, all of them, or a limited number. For each entry, WIRS performs 38 engineering edits which identify such errors as two wires using the same pin or the same wire number, release sequence errors, or connectors that don't match. Other automatic checks catch invalid wire codes, aircraft effectiveness errors and the like. "By catching errors before they get into the system," Beers points out, "we cut the total number of basic changes to be processed by 25 percent. And we accomplish more of them in sequence, without reworking a bundle of wires that is already completed."

"IMS lets us access a wire or bundle in many ways," says Beers. "Engineers can look at a particular bundle or equipment item, or look for all wire of one type. They can go in by airplane number, change number, or by customer. Since a complete history is retained, they can look at past configurations, and see when a change was made."

"Today, we roll out seven 747's a month," Beers continues, "for any of 64 different customers. Since there is less lead time on wiring than on any other part of the design, we couldn't sustain that production rate without such a system."



A Boeing 747 jumbo jet contains two tons of copper wire: 49,000 separate segments. Keeping track of the details of this massive electrical system requires the services of a large IBM computer.

With \$15 Million Network System Moves Small Hotels Into Big Leagues

PHOENIX — Chalk one up for the little guys.

At a time when the economy is taking a heavy toll on many balance sheets, business is booming at the 2,600 small, individually owned hotels, motels and resorts associated with Best Western International, Inc.

According to Bob Hazard, Best Western's chief executive, a cornerstone of that success is a worldwide "instant" reservations and communica-

cations system and "its ability to deliver 15% to 30% of a property's occupancy at a cost of less than half that of competitors."

"Computerized reservation systems are by no means new to this industry," Hazard admitted. "However, the significance of our system is that for the first time smaller hotels, motor inns and resorts have the best marketing and reservations system in the world."

Best Western recently pushed the button on the \$15 million network that links Best Western properties nationwide with 18 countries. Hoteliers in places like Menominee, Wis., and Limerick, Ireland, soon will be using IBM 3101 CRT terminals to route reserva-

tion data to strategically placed IBM Series/1 minicomputers, which will communicate with Best Western's computer center here in Phoenix via satellites.

"Our industry's basic service hasn't changed in hundreds of years," said Jerry Petitt, Best Western's vice-president of operations. "But what you're seeing today are the small independent hotels leading the technological race. Booking a room in a vacuum isn't what we need. What we need is the ability to make and change reservations rapidly."

Best Western officials noted that today there is a two-day turnaround for European travelers booking a room in

the U.S. — not only slow, but costly and error-prone as well. With the computer network, Hazard said the process will take about 30 seconds, cost less, and help ensure accuracy.

The next step in what one executive called Best Western's "electronic umbilical cord" will be more sophisticated links to airline computers and the thousands of travel agents who routinely use them. Plans are also under way to develop a property management system tailored to the needs of each hotelier.

Best Western, by "wearing both a marketing and technology hat," has increased its market share from 5% in 1975 to 11% in 1979, Hazard said.

Call for Papers

THE FIFTH WESTERN EDUCATIONAL COMPUTING CONFERENCE, San Francisco, Nov. 19-20.

This consortium of computing educators and professionals is seeking original papers dealing with computers and computer applications.

Abstracts and papers in duplicate, double-spaced form, not exceeding 1,500 words in length, should be sent to Prof. Elizabeth Alper at the Computer Science Department, Hartnell College, 156 Homestead Ave., Salinas, Calif. 93901, no later than March 1.

FIRST IASTED INTERNATIONAL CONFERENCE AND EXHIBITION APPLIED MODELING AND SIMULATION (AMS '81), Lyon, France, Sept. 9-11.

The scope of the conference covers numerical methods, graphical techniques, languages, software, hardware, computer assisted modeling and operations research methods. Special emphasis is on applications in all fields including physics, chemistry, metallurgy, all areas of engineering, wood, pulp and paper, power systems, process control, robotics, terrestrial and aerospace vehicles, energy systems and sources, physiology, medicine, food and agriculture, soil sciences, hydrology, seismic applications, education, sports, sociology, management and economics and water resources.

Regular papers and tutorials are being solicited. Three copies of a 200-word abstract should be submitted to the Secretary by March 1. Complete manuscripts of accepted papers are due July 1 for publication in the proceedings.

For correspondence and submission of abstracts write to the Secretary, AMS'81, AMSE, 16 Avenue de Grange Blanche, 69160 Tassin-La-Demi-Lune, France.

**FOR
SALE**
DEC
NEW!
• DZ 11A
• DZ 11C
• DH 11AD
• DH 11AE
IMMEDIATE DELIVERY
800 - 854 - 0350
(CAFF. 714-632-6986)
DATABASE
The DEC Specialists®
**CALL
NOW!**

COMPARE FLEXIBILITY.

Model 950

- Advanced editing with wraparound
- Smooth scrolling
- 15 baud rates (50B to 19.2kB)
- Protected fields
- Underlining
- Split screen with line lock
- Non-glare screen
- Programmable function keys
- 15 special graphics characters
- Versatile screen attributes
- Self test
- 25th status line
- Buffered auxiliary port
- 14 X 10 character resolution
- Integral modem option
- Tilttable screen



Tailor this smart CRT terminal to your particular needs and make it your own. It has the flexibility and brains to provide all the performance you need but is priced to make sense whether you need 10 or 1,000.

The TeleVideo model 950 detachable keyboard CRT Terminal has 11 special function keys—22 functions with the shift key—that can readily be programmed to your requirements using 256 bytes of on-board RAM.

You needn't stop there. You can change keys, key functions, even keyboard locations. And the 950's microprocessor based design means you can customize the firmware for your system.

Of course the 950 has premium TeleVideo performance—advanced editing with wraparound, split screen with line lock, and smooth scrolling. It also features a

25th status line, speeds to a true 19.2 kilobaud, and 15 special characters for powerful line graphics.

Contact TeleVideo for a detailed brochure, or call today to discuss how you can use these capabilities to make this terminal uniquely yours. TeleVideo, Incorporated, 2149 Paragon Drive, San Jose, CA 95131. (408) 946-8500.

Nationwide Field Service is available from General Electric Company, Instrumentation and Communication Equipment Service Shops.

TeleVideo®

COMPARE PRICE.

CALIFORNIA Santa Ana (714) 557-6093 • San Jose (408) 946-8500 • MASSACHUSETTS Boston (617) 668-6891
NEW YORK/NEW JERSEY Morris Plains (201) 267-8805 • TEXAS Dallas (214) 980-9978

The Zenith Smart Terminal.

Compare the features.

Reverse video by character can be used to emphasize words, lines, phrases or paragraphs.

High Resolution CRT reduces eye strain and operator fatigue.

Z80 Microprocessor-control brings easy editing, cursor flexibility and reverse video highlighting to your on-line system.

Professional touch keyboard follows standard typewriter layout with 72 keys, including 12 special function keys, (8 user programmable) plus 12 key numeric pad.

Underline or reverse video blinking cursor is addressable to allow you to edit or correct on the entire screen.

80 character by 24 line format, plus a 25th line for operator messages and prompts.

Displays complete ASCII character set including upper case, lower case with descenders and special graphic symbols.

Insert and delete character features allow easy correction or modification of displayed information.

Cursor and special functions are accessible by keyboard or outside computer.

Professional appearance and compact size looks and fits well in any location.



Then compare the price.

For under \$1000,* the Zenith Z19 smart terminal is a very smart buy. It can be utilized with almost all commonly available computer systems and provides the most advantageous features for data entry, editing, inquiry, and transaction processing—wherever you need a top-of-the-line, general-purpose terminal.

The Z19 is ideal for high speed data entry. The 12" diagonal CRT gives you a crisp, clear video image. And the Z19's keyboard follows the standard typewriter keyboard layout for operator ease. Along with this you get ANSI and DEC®-VT52 compatibility. And one other

important plus: Quality you can depend on, because it's Zenith.

For more information about the Z19 video display terminal, send us the coupon. For fast information, call 800-331-1750, Operator 36, toll free. In Oklahoma call 800-722-3600, Operator 36.

*Suggested retail price.

ZENITH | **data**
systems
1000 MILWAUKEE AVENUE, GLENVIEW, ILLINOIS 60025

The quality goes in before the name goes on.

DEC is a registered trademark of Digital Equipment Company.

Zenith Data Systems
1909 E. Cornell, Peoria, Illinois 61614

Please send me more information on the Z19 video display terminal, and include your dealer and service center list.

Name _____ Tel. _____
Title _____
Company _____
Street _____
City _____ State _____ Zip. _____

CW0126

With DP One-Third of Budget, Credit Firm Stays Competitive

Special to CW

DALLAS — Most large corporations, active in many different business areas, typically have a DP outlay that equals 1% of sales. Chilton Corp., however, is dedicated to only one business — consumer reporting and collection services — and its DP costs run as high as one-third of the company's total operating budget.

What this means is that Chilton, like other small companies, cannot as readily absorb the capitalization, expansion and maintenance costs associated with large computer systems. Already at a dollar disadvantage in an extremely competitive market, it remains vulnerable to differences and fluctuation in computer system pricing.

Chilton claims second place in a field that includes five consumer credit reporting services nationwide, all vying for a market that may have in excess of 150 million consumer credit applicants per year. Chilton alone — with 20% of the market — answers nearly two million credit inquiries every month.

Sound Alternative

Faced with the need to spend funds efficiently as well as to obtain promised deliveries on time, Chilton decided to go outside the mainstream of multipurpose computer manufacturers. To Chilton President Van Smith, only one supplier offered a sound alternative.

"Four years ago, when we were ready to purchase a high-performance system, an IBM 370/168 was selling for more than \$5 million. When we finally bought our first Amdahl Corp. system — a 470-V/6 — we ended up with even greater performance than a 168 at only 65% of the cost, a savings of almost \$2 million."

"And we saved even more dollars when we bought a V/5 in 1978, which was traded for a V/7 last year," Smith said.

"What this cost-effectiveness has done," he added, "is permit us to stay competitive with the larger companies that can afford to pay the higher prices. It gave us the ability to move into high-volume processing and deliver a service that would have been financially straining otherwise."

"It has also kept the price increases of our services to the customer well below the rate of inflation, typically 3% to 4% annually. We've been able to lick the high cost of computer systems and annual rates of inflation."

Prior to the present Amdahl computers, Chilton had an IBM 370/145 and an IBM 370/158.

"It is significant that, of the

five consumer credit reporting services, three of them presently use Amdahl computer systems — TRW, Inc., Pinger and Chilton," Smith continued. "So, it is safe to assume that performance as well as price was a motive in buying Amdahl."

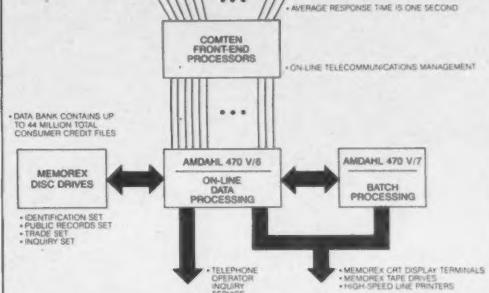
Chilton's relationship with Amdahl extends to most of the other vendors that supply pe-

ripherals — primarily Memorex Corp. for CRT terminals, disk and tape drives, but also including Comten, Inc. for front-end processors, Paradyne Corp. for modems, Mohawk Data Sciences Corp. (MDS) for remote printers, and Documentation, Inc. for printers, card readers and card punches.

(Continued on Page 46)

* 1800 DEDICATED TELEPHONE CHANNELS HANDLE 4000 TELETYPE TERMINALS
AT 62 BUREAUS/AFFILIATES AND HIGH-VOLUME SUBSCRIBER OFFICES

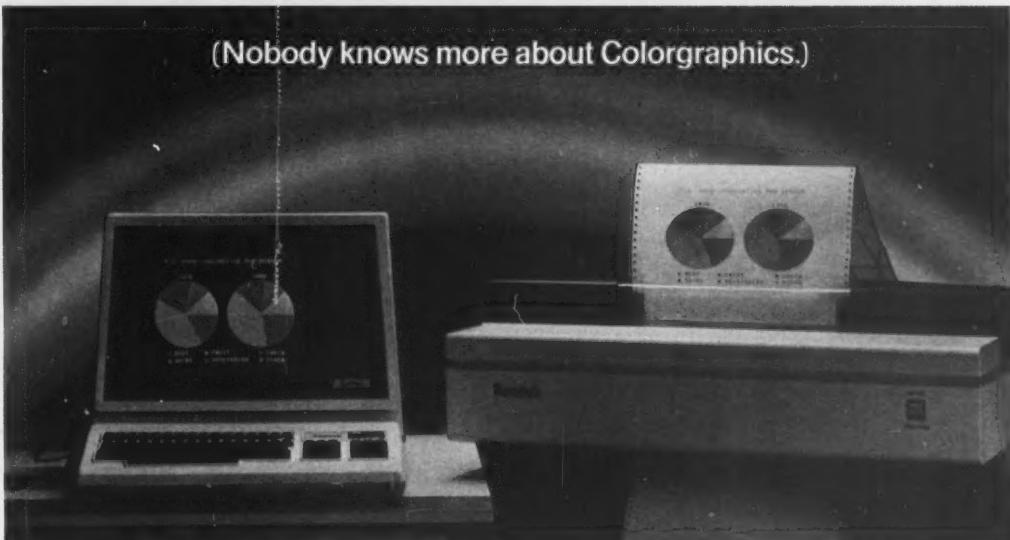
* * * * * AVERAGE RESPONSE TIME IS ONE SECOND



Chilton Corp. Consumer Credit Reporting System

Ask Ramtek.

(Nobody knows more about Colorgraphics.)



Now, Ramtek offers the first integrated system for MIS graphics users.

Ramtek's new 6214 color graphic computer frees you from buying each of your display elements from a different supplier. Ramtek has put it all together in a true stand-alone color graphics system complete with processor, monitor, console, mass memory storage and UCSD Pascal.TM And full Ramtek support with field service, training and documentation.

You'll get a sharp, bright picture.

The 6214 gives you high resolution—640 x 512 refresh memory for smooth, curved plots. Choose 16 colors from a palette of 64, with no annoying image flicker.

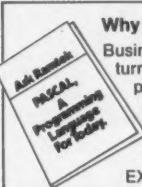
Interactive UCSD Pascal makes programming easy.

Complex programming is simplified with Pascal. Adding Ramtek's GRAFPRO (graphic procedures) software package provides the basic drawing functions, programmable patterns and text fonts you need. To dramatically speed applications software development.

Now, low-cost plain paper and photographic hardcopies.

The new Ramtek 4100 printer/plotter cuts the cost of hard copy. Ramtek's unique four-head design prints full color graphics on plain paper in a single pass. No toners or chemicals are required, and to change ribbons you simply drop in a new cartridge. Add a color camera for transparencies, 35mm slides, and 16mm film.

For MIS, computer-aided design or any application that requires high resolution, high-performance color graphics, look into Ramtek's 6214 colorgraphic computer. To get more information, write: Ramtek, 2211 Lawson Lane, Santa Clara, CA 95050.



Why is Pascal better for business?

Business, industry and education are turning to Pascal for their interactive programming needs. To find out what Pascal offers and how it can benefit you, request "Pascal, A Programming Language For Today." It's Issue Number 1 of Ramtek's "USE OUR EXPERIENCE" series.

Ramtek
Our Experience Shows.

REGULAR OFFICES: Santa Clara, CA (408) 988-2211, Newport Beach, CA (714) 979-5351, Seattle, WA (206) 838-5196, Albuquerque, NM (505) 884-3557, Dallas, TX (214) 422-2200, Maitland, FL (305) 645-0780, Huntsville, AL (205) 837-7000, Chicago, IL (312) 397-2279, Cleveland, OH (216) 464-4053, Washington, DC (301) 656-0350, Metropolitan NY (201) 238-2090, Boston, MA (617) 273-4590, Netherlands 31 2968 5056.



A data processor checks programming information on one of many Memorex 1377 CRT terminals used to access the computer systems at Chilton Corp.

DPCost-Effectiveness Keeps Credit Firm Competitive

(Continued from Page 45)

In Smith's words, "The relationship that Chilton has with its suppliers is that all of us are competing with someone bigger. Since our product lines are pretty much specialized — with fewer diverse activities to divide our attention and lower efficiency — they understand what our needs are. Consequently, our channels of communication with these companies are very smooth and direct."

"All told, it has cost us \$6 million for mainframes that probably would have cost \$15 million to \$20 million had alternatives not been considered."

Saving money on a computer system may be the overriding concern, but to

a company like Chilton, other factors have also contributed to its success. "Take delivery time, for example," Smith said. "If we had just a mild business growth over the last 10 years, we probably could have lived with IBM's delivery schedules. But Chilton's growth has been phenomenal, and if we had to wait for a new computer or more disk drives, we might have passed some new business opportunities. There have been times in the past when we couldn't get a much-needed terminal from IBM for 18 months or more."

Perhaps more than any other factor, Smith said, system reliability plays an important role in Chilton's success. Since the Amdahl systems have been installed, Chilton has never had a major service interruption, he noted.

At the present time, Chilton uses its Amdahl 470V/6 (acquired in February 1977) to process all on-line credit inquiries from its 62 bureaus and affiliates. Although the 470V/7 (which replaced the V/5 in June 1979) is primarily used for batch processing, it can be switched to on-line communications at any time, suiting it as a backup for the V/6. The present memory capacity of the V/6 is 6M bytes, with 8M bytes for the V/7.

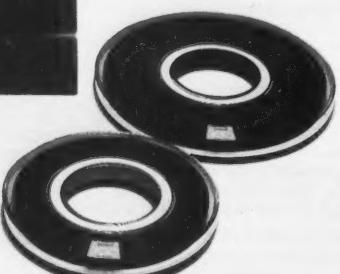
Peripheral equipment at Chilton includes a large number of Memorex 3228 tape drives and 3650/3675 disk drives, Memorex 1377 CRT terminals, Comten 3650 front-end processors to handle large-volume traffic switching (one is actually a backup) and high-speed Documentation 2,250 line/min printers in-house.

Network Experts To Teach Course

LOS ANGELES — "Experts on Networks" is a three-day seminar designed to help make network planners less reliant on systems vendors for advice, according to the seminar organizers, Technology Transfer Institute. The seminar will be held in Los Angeles on March 18-20.

Leonard Kleinrock, from the University of California at Los Angeles, Wushow Chou, from North Carolina State University, and Lawrence Roberts, president of GTE CNS Products, will discuss packet switching, public packet networks, Systems Network Architecture and network design issues.

Registration costs \$675. More information is available from Technology Transfer Institute, P.O. Box 49765, Los Angeles, Calif. 90049.



3M Hears You...



AKD HOTLINE for INSTANT QUOTES

VOLUME DATA ENTRY SERVICES

• OMAHA •

(800) 228-9410

WX 9106220198

AMERICAN KEY DATA

Mid America Plaza, Suite 144
7171 Mercy Rd., Omaha, Ne. 68106

IBM 3270 Users:

Get on the PTS-2000 Growth Path.

**And get one low-cost, high-performance
terminal family that expands
with your needs.**

Imagine a single 3270-type product line that can be expanded in large or small increments, with functions that range from basic inquiry/response to multi-station, multi-peripheral operation, and with support, service, and pricing advantages that are unparalleled.

Hard to imagine?

Well look at Raytheon's PTS-2000 product family.

You install it just once, and then add the 3270-compatible capabilities you need as you need them.

Capabilities that start with BSC and grow on-site, to SNA/SDLC support, 3276/74/78 compatibility. Large display screens, up to 3440 characters. Enhanced 3270 function. Cursor select and 25th line features. Data rates up to 9600 bps. Numerous operator convenience and productivity aids. Built-in diagnostics. And a unique distributed-intelligence architecture that allows for rapid and significant future expansion.

The PTS-2000 display system supports 3276/78 small-cluster systems in both BSC and SNA/SDLC protocols, and 3274/78 large-cluster systems as well. It differs from all other terminals in its class in that the PTS-2000 is designed to be upgraded in modular fashion from single station or small cluster capability to large cluster, full function, enhanced 3270 capability without equipment swapout ever...easily and with significant cost savings always.

The PTS-2000 from Raytheon. A total economical solution, with fast delivery, from the company that has over 150,000 Intelligent Terminals installed. Find out more by calling your local Raytheon Data Systems sales office today. Or call us at 800-343-6676.

*Another Raytheon
Intelligent Associate
Product.*

**3276/78
BSC**

**9600 BPS
DATA RATES**

**WATCH THIS
SPACE.
THE GROWTH
GOES ON.**

**3276/78
SNA/SDLC**

**3274/78
BSC**

**3440
CHARACTER
SCREENS**

**3271/77
BSC**



RAYTHEON DATA SYSTEMS

Intelligent Terminals, Distributed Processing Systems

Word Processing Systems, Minicomputers

Telecommunications Systems

1415 BOSTON-PROVIDENCE TURNPIKE
NORWOOD, MASSACHUSETTS 02062



"We switched to NCR"

Frank J. Sanzone, Jr., Carroll County General Hospital

SANZONE:

We switched to an NCR computer for several reasons. First, we had to have an interactive system. And only NCR seemed to offer true interactivity with the power we needed.

NCR's MONOGUE:

And with the capacity to grow.

SANZONE:

Second, we had reached a gap in our vendor's range of systems, so we were facing a difficult conversion any way we turned. With NCR, we knew we would not run into that kind of gap again.

NCR's MONOGUE:

That is NCR's Migration Path Engineering. We believe a user should be able to upgrade his hardware without obsoleting his software.



Frank J. Sanzone, Jr., is Assistant Director of Finance, Carroll County General Hospital, Westminster, Maryland. Robert Monogue is an NCR Representative.

SANZONE:

Then there's multiprogramming, a feature rarely available on systems the size of our NCR I-8410. Without multiprogramming, we would have had to add a second shift. And there's ease of operation. Training an operator takes just hours. In fact, this system runs just the way you said it would. We did the right thing in switching to NCR.

NCR is a different computer company. We don't pose problems, we help you solve them. Find out what we can do for you. Call your local NCR representative. Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

NCR
Complete Computer Systems



An NCR computer can make it happen for you, too.

Slower Benchmark Times, Lower Cost

Apple May Win in 'Least Expensive' Category

One of the industry's most popular personal computers, Apple Computer, Inc.'s Apple II, did not match benchmark times of more expensive systems, but does appear headed for victory in the "least expensive" category. The Apple underwent testing in the Association of Computer Users' (ACU) Series 1 Benchmark Reports.

Priced under \$4,300 for a complete system with dual minidisks and Centronics Data Computer Corp. 779 printer, the Apple II can be configured more cheaply than that and features an entry-level price below \$1,000.

While the system's benchmark test results were slower than some others we've looked at, they were not unreasonably so, especially considering the fact that this is a minimum-cost setup. However, potential business users should be aware that systems in this price bracket may lack sufficient diskette storage, memory capacity and system expandability for use in a general accounting application, except in a very small business environment.

Instead, the Apple finds applications where less computing power is needed. In the business field, Apple finds more use in management planning and personal financial planning. While an accounting package is offered, the firm states that it is designed for use in businesses having fewer than 500 customer accounts, 100 vendors and less than \$1 million in total dollar volume annually. Some dealers are even more conservative than this in recommending the Apple as a general-purpose bookkeeping system.

Slower Times

While the Apple II's time for the scientific/engineering problem was about average for the systems tested so far, its accounts receivable performance lagged behind — slowed, no doubt, by the diskette drives, which are required extensively in that problem. It is important to put this in perspective, though, because most Apple customers are first-time computer users. Since they are computerizing an application for the first time, the relative speed of one computer over another is insignificant compared to the difference between human and computer.

Instead, the determining factor in the low-cost systems is often software. Good software availability spells success, as in the case of Apple and Radio Shack's TRS-80, and poor software availability leads to difficulties such as have been reported by users of the Texas Instruments, Inc. 99/4. Many users of Apple and other low-end computers do not program at all; they simply plug in cartridges, tapes or diskettes and run the programs.

The marketing approach reminds one of competing videorecorders, each manufacturer hoping to offer more programs in its format and thus dominate the market.

Market Evolution

The current situation represents the third stage in an evolutionary process by which the home computer market developed and has spread upward into small business computing. Initially, the microprocessor-based systems were available in kit form or in hand-built ready-made hobby versions. The

SCOREBOX

System: Apple II
Current Price: \$4,270

Series 1 Results****
 Systems up to \$15,000

	C-1	C-3
	Scientific-/Engineering	Accounts Receivable
	Time	Time
Pertec PCC 2000	28:48.4	6:04.3
North Star Horizon	12:01.9	1:57.7
Cromemco System Two	14:52.6	2:48.0
Texas Instruments 771	22:05.4	3:38.1
Vector Graphic System B	19:30.0	5:56.5
Decstation 78	22:35.6*	5:04.8*
Radio Shack TRS-80 Model II	20:00.7	3:38.6
Apple II	21:11.0	6:17.4

Series 2 Results****
 Systems \$15,000 to \$25,000

	C-1	C-3
IBM 5110	29:47.2	4:11.0
Wang 2200VP	2:05.8	3:20.0
Texas Instruments FS990/10	**	3:18.6
Hewlett-Packard System 45	4:38.9	5:05.8
DEC PDP-11V03	14:43.4	4:14.0
Q1 Lite	6:50.7	5:03.3
Univac BC/7-610	12:09.2	10:37.0
Northern Telecom 405	**	**
Datapoint 1170	38:27.5	6:50.4
Randal 100	13:52.4	10:05.0
Hewlett-Packard 250	4:05.9	4:45.7
Texas Instruments DS990/2	**	2:48.3

*Results include both compile and run time.

**Test could not be run because of memory limitations.

***Test could not be run because of formatting limitations.

****Both Series 1 and Series 2 were run on the same programs.

This is the 22nd in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member nonprofit organization.

purchasers then were likely to be electronics experts who could program and engineer their way out of the difficulties those early systems presented.

Later, mass-produced systems such as the Apple appeared, and the electronics expertise was no longer so important. A second group of users entered the market — those who could program small systems in a high-level language, but had little engineering experience.

Eventually, software became available for a variety of different applications, and the combination of reliable hardware and packaged software made owning a computer feasible for the average businessman or professional. For the first time, the inexpensive computer could be sold to people with no prior data processing experience whatsoever.

The new customers of small computers tend to fit one of two molds: users with primarily educational and home applications in mind, and those with

specific business applications, such as business financial planning or accounting, as the intended application.

Apple's Strong Applications

It is possible that many justify the expense of a starter system as a means of gaining experience with computers cheaply. These professionals may keep the system at home, keeping it for personal finances, games and their children's use. Eventually, they acquire enough knowledge about computers to make an intelligent purchase for business use.

Apple's "Dow Jones series" of personal finance programs is an excellent package for this type of user. It includes a news and quotes reporter program and a portfolio evaluator program. Both of these are used in conjunction with a time-sharing service to provide stock quotes and financial news.

Apples also find use in particular areas within some businesses. Using

the Visicalc program, part of the Decision Evaluator package, businessmen can explore financial forecasting at a low price tag. For larger planning efforts, Apple offers a Desktop/Plan program. Both of these can be combined with Apple Plot, a graphics display package.

Our survey of a small sample of Apple users, taken by the consulting firm that performs ACU's benchmark tests, revealed some dissatisfaction with the system's accounting package, called The Controller, and with after-sale support from the local dealer. But other users were quite satisfied overall.

Of seven contacted who had purchased the accounting package, four had negative comments about speed, adaptability and capacity of the system for their application.

Only a small percentage of the group surveyed were doing any programming in-house. Some were using the computer very little, because it had not turned out to be suitable for the task they had intended it for.

It seemed apparent that some of the Apple business customers had either been oversold on the performance of the machine or had not even inquired as to its suitability before purchase. Their experiences varied according to the level of support and guidance supplied by the vendor.

Even though the price tag on a microcomputer is lower than that of a more sophisticated system, the evaluation process should be the same. The customer must ensure that equipment and software purchased are adequate for the intended application.

About the Author

Hillel Segal is president of the Association of Computer Users (ACU), a nonprofit association with members all over the U.S., Canada and many other foreign countries.

One of the association's key activities is the publication of its "Benchmark Reports." Each month a new 24-page report is produced covering another computer system.

In addition, ACU publishes seven bimonthly newsletters for users of small computers, midi computers, large computers, time-sharing systems, distributed processing systems, word processing systems and home and hobbyist computers.

A complete package of information about the benefits of membership in the Association of Computer Users is available from the group through P.O. Box 9003, Boulder, Colo. 80301.

CICS COURSE

HANDS-ON COMMAND LEVEL

held in New York City,
 the start of each month.

CICS INTERNALS COURSES and IN-HOUSE COURSES

also available.

VERHOEF INF. PACKAGES, INC.

28 Hathaway Lane

Eaton Falls

N.J. 07021

U.S.A.

(201)

226-0114



EMPIRE™



The one financial modeling system you'll never outgrow.

Other financial modeling systems work fine. To begin with. The problem is that they can't expand as your company's requirements expand. You're stuck with a tricycle in the jet age.

EMPIRE is the most powerful and complete decision support system — designed for your growing needs. EMPIRE understands the language of business and is easy to learn. A beginner builds models after a two-day class. The sophisticated user can take advantage of a modeling language used by major consulting and time-sharing companies to develop their proprietary products.

With EMPIRE you can examine an unlimited number of scenarios before you commit resources. With EMPIRE you can generate clear, attractive management documents. You can even create color plots and pie charts.

EMPIRE, the decision maker's decision-maker, is available on DEC-10, DEC-20, VAX, VM/CMS, and MVS/TSO systems.



**APPLIED
DATA
RESEARCH**

For information, contact:

EMPIRE Information Center
Route 206 & Orchard Road, CN-8
Princeton, New Jersey 08540
(201) 874-9000

INTERVIEW WITH DOUGLAS F. PARKHILL

Telidon: Canada's Experiment with Viewdata

What are the responsibilities of Canada's Department of Communications?

Our responsibilities range from radar research and a comprehensive general communications research program at one end to fiber optics and the Telidon program. That program originated in our lab, as a matter of fact.

Readers often see significant claims for Telidon even though, generally speaking, there is very little new technology involved. Does Telidon really differ from other viewdata experiments?

It's true that the technology of viewdata is not new. The whole concept was originated by the British with their Prestel [viewdata] and Oracle/Cefax [teletext] systems.

The difference lies in the ways we store and transmit information. Earlier systems, such as Prestel or the French Antiope system, are "alpha-mosaic." That is, if you imagine the TV screen as divided into a finite number of squares, these are mapped into the computer memory with an exact one-to-one correspondence. To draw a line on a CRT with these systems, the appropriate squares are filled in with the necessary character.

Telidon, however, makes the display totally independent of the way in which data is stored or transmitted. [Early in our research] we were able to show that any picture can be represented with a finite, and small, number of "picture primitives" or "picture description instructions" — PDIs. There are eight of these, such as arcs, polygons, bits and so on.

What is the advantage of this approach?

It makes the display totally independent of the way data is stored or transmitted. Data bases can be accessed with displays having any desired resolution; the displays need not be conventional TV sets. In Telidon, drawing a line from one corner of the screen to the other involves transmitting the endpoint coordinates of the line. This is done by having a small microprocessor inside the terminal that interprets the [transmitted] instructions.

Does this give you any real advantage? Doesn't it simply add to the cost of the system without supplying any real benefits?

This approach is called an alpha-geometric system, and it is oriented towards producing good graphics. The graphics that appear on the screen are totally independent of the way data is stored, and the resolution obtained is always the best possible resolution the individual display can provide.

For example, we can handle any alphabet — Chinese, say — as well as script. Moreover, we can have overlays of one picture on top of another. Most important, we can handle motion, and all this can be done over a low bandwidth communications line.

In some ways this system sounds analogous to Telenet or Tymnet in that the communication aspect is separate from the data and a wide range of terminals can be accommodated.

Exactly. Our objective was to make the system independent of the display technology, since we expect that displays may improve with time and people's needs may change. However, you don't want to have to go back and rewrite the data base every time the display is changed.

We didn't necessarily design this system with the Telenet model in mind, although we had been doing extensive work in packet-switching. Canada, as a matter of fact, was one of the major participants in the development of the packet-switching standard, and our lab is pretty conversant, of course, with these technologies.

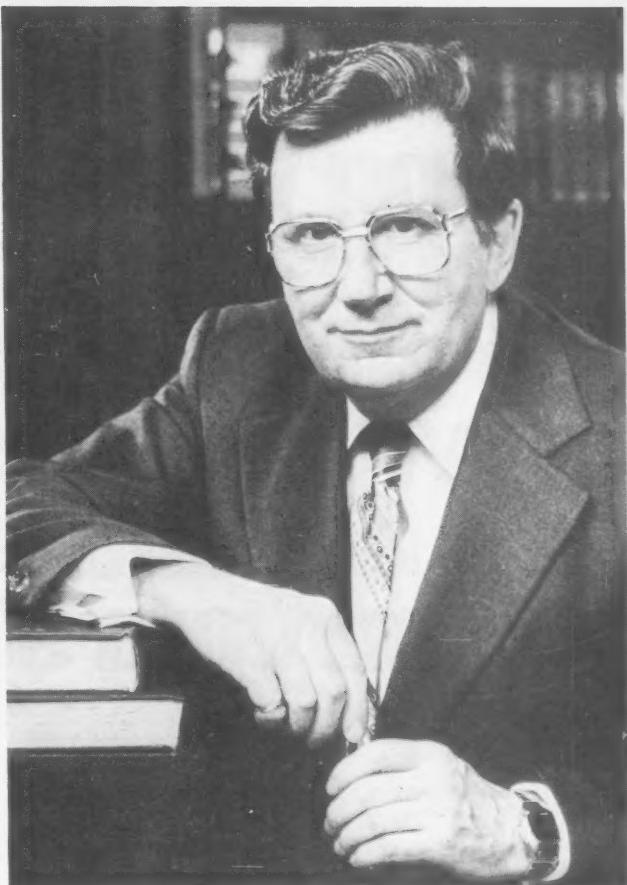
How, then, did Telidon come about?

Telidon was not [originally] intended for viewdata at all; we had been looking for ways of carrying on pictorial or graphical conferencing over the phone.

The British Prestel system had roughly 5,500 subscribers as of last September, despite the fact that they've been in business for more than two years. Are the British beating a dead horse?

I think they are. The only problem, of course, is that they've spent so much money in this particular technology it would be very difficult for them to switch. Because they were very early with it, they used a fairly primitive, brute-force approach to the technology. It wasn't up to scratch, and my personal view is that they will probably

(Continued on Page 52)



Douglas F. Parkhill is Assistant Deputy Minister (Research) for the Canadian Department of Communications, Canada's largest government communications research and development activity.

Since his appointment in 1974, Parkhill has led many major policy and technical activities concerned with communications satellites, computer/communications systems, command and control systems and telecommunications. It was under his general direction that Telidon, the Canadian viewdata system, was developed, and he still maintains responsibility for that system.

Parkhill has published widely and is the author of *The Challenge of the Computer Utility*, which was a 1966 winner of the McKinsey Award for an outstanding contribution to management literature. More recently he edited a book called *Gutenberg 2* about viewdata experiments and electronic publishing. He holds a B.S. degree in electrical engineering from the University of Toronto and an honorary doctorate in engineering from the University of Ottawa.

Before taking his present position, Parkhill was Assistant Deputy Minister (Planning). He joined the Department of Communications in 1969 from the Mite Corp., Bedford, Mass., where he was head of the Satellite Communications Department. He has also held engineering positions with General Dynamics Corp., Avco Corp. and Computing Devices of Canada.

Parkhill was interviewed for Computerworld by free-lance computer journalist Howard Karten.

CANADA'S VIEWDATA EXPERIMENT

IN DEPTH

Page 52

(Continued from Page 51)

bly suffer the consequences. I envy them the enormous resources they've put into marketing and developing their system, and we owe them a debt of gratitude for pioneering this to bring it to public attention.

[We also are indebted to them] for establishing the basic principles for the operation of a public system and for the idea of separating those who provide the information from those who distribute it.

What about the number of subscribers — isn't it rather small given the amount of resources that have gone into the system?

It's amazingly small. I'm continually astounded by it [laughs]. I guess people can draw their own conclusions from it, and it's not up to me to do that. But it does indicate that something is radically wrong either with the

technology [itself] or with the way it is being exploited.

Similarly, the service of Source Telecommunications Corp. (The Source) reportedly has a large number of subscribers as well as electronic mail, but it still appears to have financial problems.

Does this suggest that perhaps people are still not ready for general-purpose computerized information retrieval systems?

I think that's very true. It's interesting that you used the term "information retrieval" because information retrieval is the area that's received the greatest attention, and at the moment most experiments are devoted to that.

However, videotex is really much broader than [merely] information retrieval. The Telidon set in my office, in addition to being an excellent means of retrieving information from a data base, is also an excellent communicator. It provides, almost as a zero-cost by-product, a telemail system. Moreover, it provides a true interactive transaction system, such as [for] buying goods from a retailer. All these interactive aspects are probably just as important — if not more so — than a pure information retrieval model.

Information retrieval will also have competition [soon] from video disks. The question is, how much information [need be] permanent and how much requires [periodic] updating? The transitory portion could be supplied via videotex or even teletext.

Recent data has shown that the best-selling items in video software are pornographic tapes, which . . .

[Hearty laughter] Maybe there's a future for Telidon in pornographic cartoons, in that case!

. . . which suggests that many of the very optimistic forecasts made for information retrieval may be off base.

If you say just information retrieval, then I think the answer is yes. But when you couple together [all the possibilities] into a single, versatile unit, you get the possibility of accomplishing a variety of things, to retrieve instantaneously — to any degree of depth you want — the information you need.

Suppose, for example, you're repairing your car at home. You could call up the necessary manual on the screen and turn the page to it electronically. Step by step, you could go through your repair. If you got in trouble, you could immediately address another data base or another section of the manual and get assistance.

That is where the graphical capabilities of Telidon are so important, [especially] in comparison to Prestel. With Telidon you can get good, high-quality pictures that can do even more. For example, if it is valves you want to adjust, you can get a slow-motion picture of how they should open and shut and what you should do to adjust them.

Even in that case, wouldn't you still be limited by the resolution of the TV picture?

You can get any resolution you're willing to pay for in the display; it doesn't have to be a conventional TV set. We use them at the moment because they're available, but in the future I can imagine the "home information center" where people might start

(Continued on Page 56)

The Wang VS computer puts the crunch on your data, without putting the squeeze on your staff.

The Crunch.

High-volume information processing comes easy to Wang Virtual Storage computer systems. Virtual memory management gives each VS user a full megabyte of logical address space for big-program development and execution. Multiple Input/Output Processors work independently to break the I/O bottleneck, buffering the CPU for faster throughput. And our sophisticated VS instruction sets cut through complex tasks with ease.

Expansion is easy, too. The VS family lets you grow from 6-user support on the VS 50 to 32 users on the VS, to 128-user support on VS 100 systems. Use up to 2 million

bytes of main memory and 4.6 billion bytes of mass storage. And get an eight-fold increase in processing speed with the VS 100's 32-bit processor, 64-bit data path and 32Kbytes of integral cache memory. While protecting your software and peripheral investment every step of the way.

Unsqueezed.

But Wang VS systems aren't just powerful computers. They're complete systems that make computer power ingeniously easy to use. Our programming aids, for example, let you create a data entry screen as easily as writing a word processing document. Our Symbolic Debug utility lets you test and modify

COBOL, BASIC, RPG II and Assembler programs at the source level. And our menu-driven file management facilities let you set up files, process transactions, generate reports and establish field-level security controls — interactively.

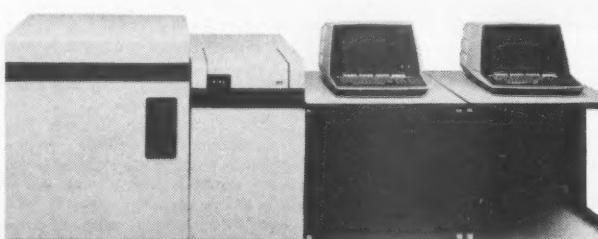
In all, Wang VS systems give you more easy ways to use computer power than any other system marketed today. Word processing, phototypesetting, electronic mail and telecommunications are all VS system options.

Call us. And let your local Wang Representative show you how to apply the crunch. Without getting caught in the squeeze.

Send Solutions.	
<input type="checkbox"/> Send more information on the Wang VS.	
<input type="checkbox"/> Show me the VS in action.	
Name _____	
Title _____	
Company _____	
Address _____	
Telephone _____	
Mail to: Wang Laboratories, Inc., Lowell, MA 01851 (617) 459-5000	

WANG

Making the world more productive.



1980 Wang Laboratories, Inc., Lowell, MA 01851

HERE'S DPS 6.

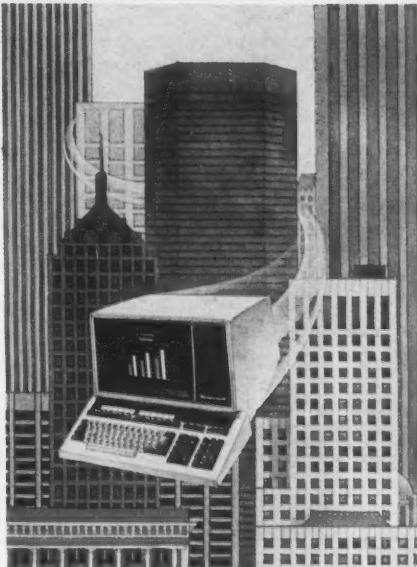
The small computer system that grows and grows and grows and grows...

DPS 6 is our new family of small computer systems, and it has just about everything you could ask for.

Altogether there are 10 models. At the low end, there are 16-bit systems that offer a range of power and capability that used to come only with much larger systems. In fact, these systems probably have the best price/performance ratio in the industry.

At the top end, DPS 6 includes 32-bit systems that we think are the most powerful small systems ever announced for business applications. (They're also pretty tough to beat in a scientific environment.)

And in between there are systems that keep adding incremental value to support different kinds of growth.



Most important, these systems are compatible—programs that run on the smallest 16-bit model can be run without changes on the largest 32-bit model. Also, the larger 16-bit models can be easily converted to 32-bit models when you need more power and capacity.

Naturally, there's software too. The best business-oriented software in the business. COBOL, transaction processing, word processing, data entry and communications. We call this combination of hardware and software Businessware. You'll call it the most efficient system you've ever seen.

And DPS 6 systems work especially well in distributed networks. Providing the up-to-date data that can mean greater productivity in executive suites, offices, factories and warehouses. Wherever people need facts and figures to do their jobs.

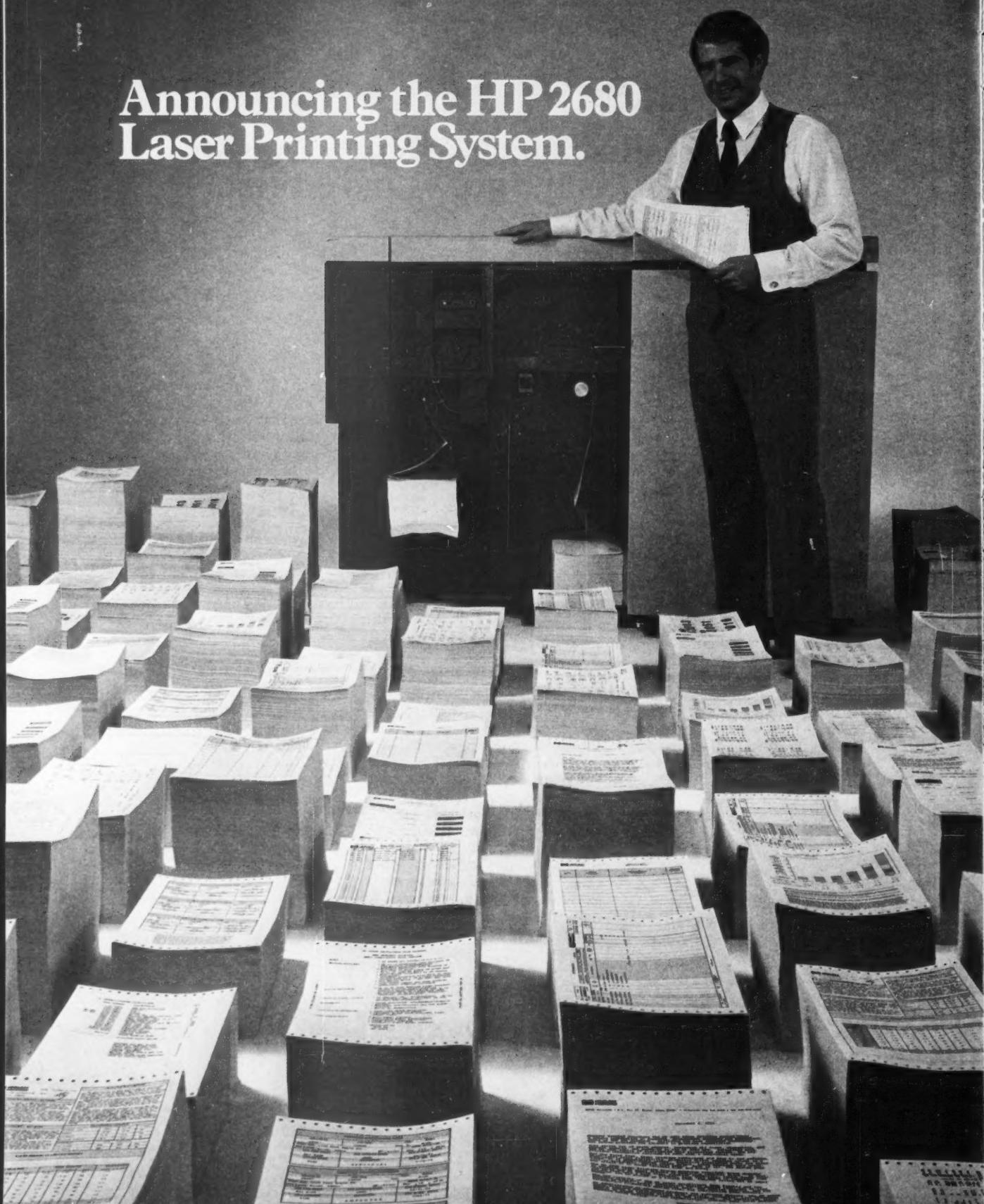
You'll find DPS 6 systems easy to install and easy to maintain. Best of all, they're so easy to expand you won't have to worry about growing too fast. Their built-in expansion capability means they'll keep on working—doing the future applications you haven't even dreamed of yet.

Power and flexibility, growth potential, and cost effectiveness. Those are only some of the reasons we think DPS 6 systems are special. To discover how they'll work for you, write Honeywell, 200 Smith Street (MS 487), Waltham, Massachusetts 02154.

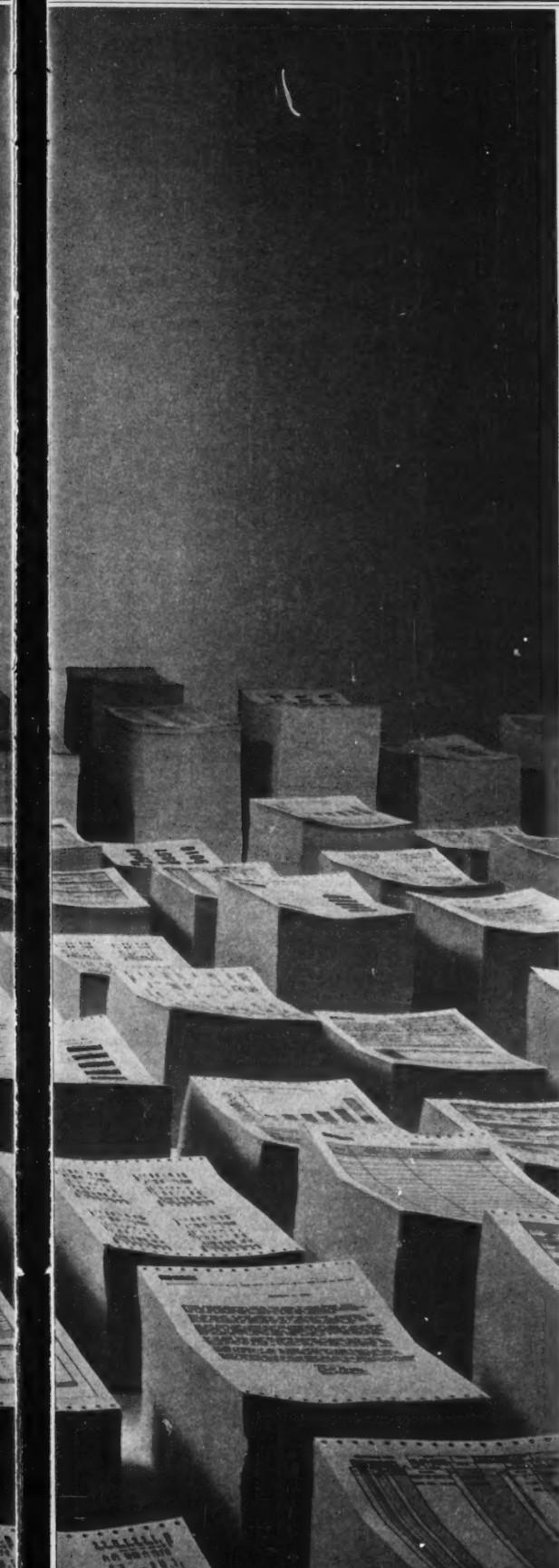
Honeywell

Original prints.

Announcing the HP 2680
Laser Printing System.



Designed by you.



With its own intelligence and our HP 3000 computer behind it (including the powerful new Series 44), our new Laser Printing System takes information directly from your data base, formats it exactly the way your users want, and prints it out on manageable, "people-sized" paper. Reports. Letters. Documents. And every one an original.

Software for creative writing.

The 2680's two interactive software packages let you design your own characters, symbols and logos, and format them any way you like on a familiar 8½" x 11" page: with windowing, scaling, shading and zooming. You can even reduce the print size to get four logical pages on a single sheet. Or rotate the forms 90° so your Z-fold output reads like a book. Then, simply tell the computer what data you want on the forms, and the 2680 does the rest—including monitoring and correcting its own print quality!

Handle less paper. Handle more information.

Think of it—with fewer pre-printed forms to stock, the 2680 dramatically reduces purchasing and inventory expenses (and the paperwork that goes with them!). And that means fewer chances for costly printing or delivery delays when you want to change the forms you're using. Add to that what you'll save on copying and reducing costs, and you'll find that the system pays for itself before you know it.

When you're ready to expand, our advanced networking software lets you send information to an HP 3000 anywhere in the world, where a local 2680 can print out your data. (As originals, of course.) And with data base management and other software features, the 2680/3000 can be a powerful part of your entire information processing system, including connections to your mainframe.

If you'd like to find out more about our new Laser Printing System, call your local HP sales office listed in the White Pages. Or write for more information, including print samples, to Hewlett-Packard, Attn: Bill Murphy, Dept. 393, 11311 Chinden Blvd., Boise, ID 83707.



**HEWLETT
PACKARD**

IN DEPTH

(Continued from Page 52)
out with a conventional TV set and upgrade it later [similar to the trading up that occurs in the hi fi/stereo market].

Do you believe, then, that viewdata-type systems that deal only with alphanumeric information are doomed to failure if they don't include some of these other capabilities?

I believe so. I think we live in a soci-

ety that has grown used to a fairly high-quality picture. Most people will very rapidly tire of [viewdata] if all they can get on a TV screen is alphanumeric information and some rudimentary graphics. On the other hand, if you provide this versatility and the possibilities of growth so that when people do tire [of the old technology] they can trade up, then [these systems will be viable].

Where will viewdata be in five or 10

years?

In 10 years I believe we'll [achieve] the old dream we've had since time-sharing [came about] of terminals becoming as pervasive and commonplace as the telephone of today. I'm certain that will happen by 1990.

By 1985 — and here I'm mostly quoting the consensus of market surveys — we'll find the beginning of the explosive growth of these home information services, corresponding to the explo-

sive growth that took place in color TVs during the '60s.

Some have suggested that viewdata is a service or an idea which is being "sold" by entrepreneurs rather than "bought" by subscribers. Do you have any comment?

Look at the environment in which it operates. If you're going to have a viewdata industry, you're really talking about a system with many different elements, all of which have to be in place and all of which have to be functioning before anything can happen or before anyone can make a buck on it.

You have to have the hardware manufacturers producing equipment at a reasonable price and of the necessary quality, for example. There are home terminals, office terminals, information provider terminals — a whole range of possibilities.

There also have to be changes in the cable or phone system to distribute the information.

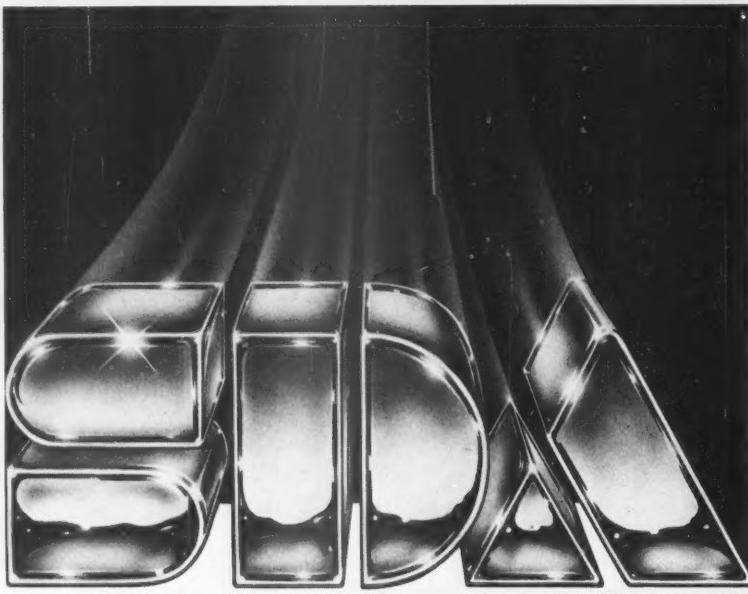
For example, in New York City today, 100,000 subscribers in a given telephone exchange, all trying to access a particular program, would totally paralyze the New York City telephone network. So we need dramatic changes there — and even greater changes in cable.

And we need to create the industry that provides the content. This is a whole new art form. It's a matter of not just duplicating what exists in the print media onto a flickering electronic picture, but taking advantage of the best of print, the best of graphic arts, the best of computer technology and creating a whole new medium. This is why government has to be involved — to coordinate the whole industry. In Europe, with the PTTs [the postal, telephone and telegraph authorities], the carriers and the government are one and the same, so it's relatively easy.

In Canada, the approach we've taken is to use the government as the catalyst. The technology happened to develop in a government lab, but it could just as easily have been in a private lab. The government recognized this, and we went to industry and set up a shared program administered by the Canadian Videotext Consultative Committee. This is a body of 30 leaders drawn from the carrier industries, broadcasters, manufacturers, information providers, cable companies and the consumer's association. We have spun off a number of voluntary private committees. You need that kind of network or coordinated government-industry cooperation which other countries have historically done very well, countries such as Japan.

The Federal Communications Commission lately has been deregulating the U.S. telephone industry. What observations do you have on those actions?

I'm not familiar enough with the details to make my comments worth very much ... The model that I think all



Meeting Tomorrow's Challenge

For over a decade, Software Design Associates has been a leader in supplying a full range of information processing services to industry, commerce and government.

We see our job as making sure you get the most from your systems, from your people and from your financial resources, now and in the future.

SDA is an aggressive, innovative company... growing at a compounded rate of 50% per year since 1968.

But it's our results, not our level of activity, that has enabled us to outpace the industry. And that is good news, because at SDA, our successes are yours.



SDA, 475 Park Avenue South, New York, NY 10016

CANADA'S VIEWDATA EXPERIMENT

IN DEPTH

countries should agree on is one that ensures that the producers of information have unrestricted access to the distribution system. That means that the distributor — the carrier, whether regulated or not — must be forbidden from having anything to do with the content.

We're dealing here with the possible replacement, or supplement, to the normal press, and if you permit any monopoly organization to say what will be transmitted over its network, then freedom is in a very difficult situation.

Speaking of changes in the telephone industry, what do you see as the major technological changes of the future in this area?

If we went to a full digital system with packet-switching techniques, the overload problem vanishes. Right now a phone call means a physical connection between two phones, and that circuit can [then] be used by no one else — even though the actual use we're making of that line [in conversation] is at a fairly low rate. With an all-digital system, you can multiplex many conversations over the same phone line or switch.

It will probably be the turn of the century before this occurs, but it's got to be done. Almost any telephone engineer these days will tell you that. To carry that digitization right through to the subscriber's phone is a longer term process, but it's got to happen.

There are other developments, too. Fiber optics will transform the whole picture by the turn of the century. With fiber optics as the local loop to the home [i.e., the interface between the subscriber and the network] you've got a channel with the ability to handle many picture channels, and that has all sorts of implications.

What about the cost factor? Is fiber optics cost-competitive with copper?

It's cost-competitive with copper today. In the province of Saskatchewan, for example, it is competitive for long-haul usage. They're engaged now in connecting all communities over 300 population with fiber optics; that one system will use as much fiber as has been produced in the world to date, and [the impact of that move] is already being felt in driving down prices.

That's probably the largest [effort] in the world to date, but I'm sure it will shortly be followed by similar efforts in other countries, including the U.S. Certainly most people feel that by 1985, for almost all applications you want to think about, fiber will be almost as cheap as copper.

Viewdata may open up new legal issues. Do you see, for example, a significant privacy issue here in terms of the government's knowing who accessed what information?

Yes, that's a *real* danger. [Clearly] if you're going to bill for information received, someone has to know in considerable detail who accessed what, for how long and all the rest. One solution to that is for the operators of the billing system to be bonded professionals and that there be criminal penalties for unauthorized release of the information.

The answer involves the whole privacy issue, and my feelings on that are pretty strong. For example, I'd like to

see a ruling saying that for a person named in a data bank, the named person is the real owner of the data — and that only he or she can decide who it is given to, and that if there is a breach of security, the person breaching it be subject to not only civil suit or slaps on the hand by fine, but also to mandatory jail sentences.

If you make the penalty severe enough, it can certainly alleviate, if not eliminate, the significance of the problem.

Do you have any pet applications in mind for viewdata?

One, announced recently in Canada, is its use in providing access by people to government data under Canada's Freedom of Information activity.

Under that program, we'll have terminals in public places across Canada this year. We hope to have the first such installations operational by this April or May.



Meeting Today's Needs

SDA recognizes that the current needs of the industry: productivity, flexibility, growth and responsive service, require up-to-date solutions. Here's how we're meeting these needs...

SCORE: SCORE is a COBOL program generator with the ability to define program requirements in the form of simple non-procedural statements. SCORE enhances the capability of the COBOL programming shop by reducing time schedules and the cost of implementation demands.

INTERCOMM: INTERCOMM is a sophisticated high through-put, fast response teleprocessing monitor designed to allow maximum use of computer resources. It provides all the necessary facilities for an on-line multi-programming, multi-tasking data communications system.

MINICOMM: MINICOMM is a teleprocessing monitor and Data Entry System using minimum resources. Its ease of installation makes it ideally suited for the DOS environment.

Whichever of our software solutions is right for you, you'll find that SDA leads the way in supporting its solutions with quality service.



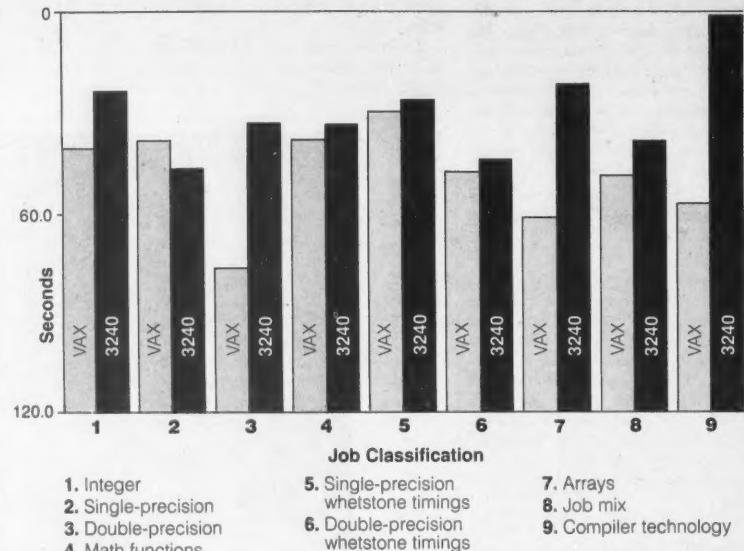
MEGA

1. Performance Measurements

Benchmark Name	VAX 11/780 CPU time	Perkin-Elmer 3240 CPU time	Performance Ratio*
PMS0154	1.140	0.907	1.26
PMS0254	4.710	4.485	1.05
PMS0354	9.160	8.990	1.02
PMS0454	43.610	43.451	1.00
PMS0554	86.420	86.123	1.00
PMS0664	1.610	1.350	1.19
PMS0764	7.040	6.679	1.05
PMS0864	13.730	13.370	1.03
PMS0964	66.830	66.068	1.01
PMS1064	132.920	129.727	1.02
PMS1124	1.520	1.306	1.16
PMS1234	2.470	2.424	1.02
PMS1324	1.310	1.618	0.81
PMS1407	251.560	37.327	6.74
PMS1507	50.260	57.657	0.87
PMS1674	22.440	23.005	0.98
PMS1724	52.550	53.133	0.99
PMS1807	50.180	34.766	1.44
PMS1907	32.020	34.679	0.92
PMS2007	17.720	20.264	0.87
PMS2107	13.450	20.242	0.66
PMS2202	33.311	26.352	1.26
PMS2324	121.610	137.997	0.88
PMS2402	0.940	0.539	1.74
PMS2502	0.720	0.562	1.28
PMS2624	122.920	227.689	0.54
PMS2708	4.850	0.961	5.05
PMS2809	103.770	0.006	17295.00
PMS2934	0.660	0.414	1.59
PMS3009	0.230	0.006	38.33
PMS3103	0.610	0.398	1.53
PMS3202	4.740	3.923	1.21
PMS3307	2.470	1.959	1.26
PMS3407	39.190	7.774	5.04
PMS3507	5.580	2.587	2.16
PMS3607	156.540	20.077	7.80
PMS3701	4.480	1.621	2.76
PMS3802	4.060	2.874	1.41
PMS3903	6.050	3.864	1.57
PMS4002	9.330	5.505	1.69
PMS4102	76.290	77.764	0.98
PMS4202	118.490	125.039	0.95
PMS4301	110.650	75.569	1.46
PMS4403	1.990	0.739	2.69
PMS4584	219.990	189.081	1.16
PMS4603	18.640	16.939	1.10
PMS4701	0.350	0.077	4.55
PMS4802	0.830	0.880	0.94
PMS4934	0.340	0.050	6.80
PMS5008	0.430	0.168	2.56
PMS5108	98.950	55.419	1.79
PMS5208	0.900	0.917	0.98
PMS5308	0.330	0.029	11.38
PMS5408	2.080	1.697	1.23
PMS5502	1.130	2.180	0.52
PMS5602	207.140	198.685	1.04
PMS5703	585.170	254.545	2.30
PMS5824	18.740	18.194	1.03

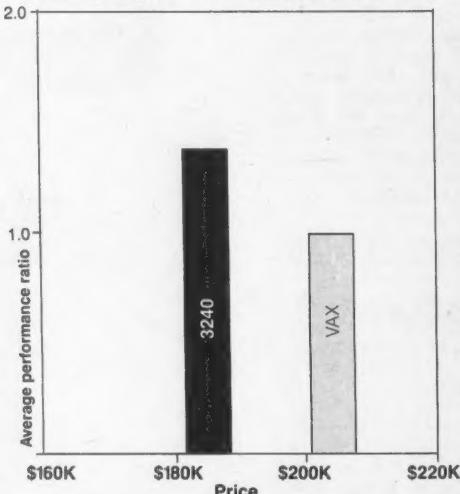
*Performance Ratio = VAX 11/780 CPU time
Perkin-Elmer 3240 CPU time

2. Perkin-Elmer 3240 vs. VAX* Average Time by Job Classification



*VAX is a trademark of Digital Equipment Corporation.

3. Proven Price/Performance



The configurations tested were 2 MB of memory, 67 MB disc, 75 ips tape, Floating Point Processor, CRT terminal, battery backup, and system software. The 3240 had a Writeable Control Store and Fortran Enhancement Package, while the VAX 11/780 had a Floating Point Accelerator.

POWER

The Perkin-Elmer Megamini® 3240 is faster than VAX.

Our 32-bit Megamini Model 3240 performed 44 out of 58 benchmark tasks faster than the more expensive VAX 11/780.

We matched our Model 3240 against the VAX 11/780 in 58 customer supplied benchmarks, comprising 697 million FORTRAN statements.

In 44 of the benchmarks, the 3240 performed faster than VAX.

Overall, the 3240 delivered an average 1.4 times higher performance.

Yet the 3240 configuration costs approximately \$20,000 less than its corresponding VAX configuration.

All 58 FORTRAN benchmarks listed in Table 1 were submitted by

our customers and prospects reflecting their application needs. Applications that deal with the same kind of problems you face every day.

All benchmarks were run on-site at various locations across the country. And all were run by vendor-trained operators.

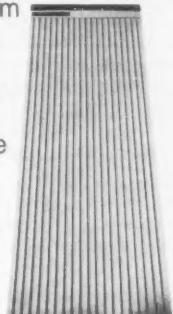
In Table 2, we organized the benchmark results into nine common types of job classification, so you can see at a glance how the 3240 stacks up vs. VAX 11/780. (The ninth classification demonstrates the superiority of Perkin-Elmer's system software, in this case globally optimizing FORTRAN VII.)

As shown in Table 3, the story is simple and uncomplicated. The Perkin-Elmer 3240 outperforms VAX 11/780. And it costs less.

The 3240 is faster than VAX in another important way—we can deliver it faster.

We'd be happy to send you a sub-set of those benchmarks which are non-proprietary or have been released with permission, so you can run them yourself. We'll also send you hardware and software documentation.

Before you make a decision on any supermini system, get all the facts on the Megamini 3240 from Perkin-Elmer.



The Perkin-Elmer Corporation, Marketing Communications,
2 Crescent Place, Oceanport, NJ 07757

Please send me complete information on the 3240
 documentation a sub-set of benchmarks.
 Have a salesman call.

Name _____ Tel. _____

Title _____

Company _____

Street _____

City _____ State _____ Zip _____

CW126-3240

Call toll free 800-631-2154.

In NJ call 201-870-4712.

EDITORIAL

IBM and X.21, X.25

With every major data communications conference, IBM seems to move closer to committing itself to domestic support for the X.21 and X.25 de facto standards for interfacing data terminal equipment to public packet networks.

At several conferences last year, IBM Chief Scientist Lewis M. Branscomb proclaimed the vendor's "enthusiasm" for the International Standards Organization's (ISO) efforts to develop an Open Systems Interconnection reference model, an architecture incompatible with IBM's Systems Network Architecture (SNA). The first three layers of the ISO model contain X.21 and X.25.

But Branscomb said IBM would wait for Bell and the other major carriers to honor those standards before incorporating them in product lines. This withholding of support tends to hurt users with international branch offices or correspondents more than other users because the X.21/X.25 standards are met overseas. But withholding also dulls the effectiveness of domestic links to the X.25-based public packet networks of North America.

At a recent conference, the president of IBM's System Communications Division, Allen J. Krowe, told *Computerworld* that IBM has pledged support for X.25 in products scheduled for shipment to the Federal Reserve System, which is upgrading computer facilities that drive electronic funds transfers. The nation will bank on X.25, the man directing the Fed's upgrade told CW last year.

Since software resident in IBM's 3705 communications controller is a currently favored approach to forging a bridge between X.25 and SNA, it will be interesting to see whether IBM will put X.25 compatibility in the 3705 replacement rumored to appear a few months from now.

Good Enough?

By the time you read this, Super Bowl XV will be history and computer prognosticator Bud Goode will know whether his Fortran program on a Univac 1106 mainframe was right to pick the Philadelphia Eagles over the Oakland Raiders for the National Football League championship.

At press time, the game looks to be close — with many variables for Goode's software to process at the Sperry Univac Data Center in Los Angeles [CW, Jan. 19]. Since computer models of human behavior are taken so seriously these days, the Super Bowl prediction seems an appropriate point to begin discussion of whether such models deserve the attention they get.

The most recent Nobel Prize for economics went to a pioneer in applying computer technology to economic forecasting, and such models command much attention in a world with prime interest rates greater than 20% per annum.

All this considered, the Super Bowl Fortran package had better be good to account for the prowess of the maverick Oakland Raiders receiver lest people begin to value such DP products in the same class as strewn tea leaves, crystal balls and the Council on Wage and Price Stability.

DATA PAST

Five Years Ago Jan. 26, 1981

BALTIMORE — While President Gerald R. Ford told Congress and the nation that Social Security taxes would have to go up in the coming year, the Social Security Administration (SSA) went ahead with plans to build a \$69 million computer facility it wasn't going to need, a computer specialist with the SSA's DP operation charged here.

Ten Years Ago Jan. 27, 1971

NEW YORK — The standard lease contract requirement of "maintenance by manufacturer" was eliminated by four major leasing companies, liberating some 500 users from single-source maintenance. The companies agreed to permit an independent maintenance company, Comma Corp., to service their customers.



Economics 81

LETTERS

Check Them Out

"Kickbacks, Gifts and Sex" [CW, Jan. 12] was totally negative and offered no positive input to readers on how to avoid unethical agencies. It is just as important for an applicant to check the references and reputation of an agency as it is for the client company to check references on the applicant.

As for false advertising (advertising nonexistent positions) and use of client company names to confuse the readers, the fault lies with the State Department of Labor. Massachusetts, at least has fairly strict laws governing agency advertising and practices. Failure to have the position openings that are advertised, deceptive use of client names or failure to make clear that the ad is run by an agency can result in stiff fines or even loss of license.

Any applicant who accepts a job without taking the initiative to thoroughly check out the financial status, stability and future plans of the hiring company deserves whatever happens to him. Prior to interviewing, the applicant should have researched the company, its products and services and all available financial reports, both for his own knowledge and to show the interviewer more than passive interest in the company.

There are also very simple methods to protect the applicant from becoming a casualty in agency wars. A competent agency can instruct the applicant in certain procedures to avoid any possibility of slander or losing the offer.

Until the Department of Labor in each state cracks down on unethical agency practices, it is up to the applicant to aggressively seek out those of us who do enjoy good, professional reputations.

Barbara Verity
Management Consultant

Gray and Steele Associates, Inc.
Boston, Mass.

Making Matters Worse

In his letter [CW, Jan. 12], reader Martin Coke missed my point, admittedly not well made. In principle, I agree with his premise that organizations of like people serve the purpose of mutual support and education of their members. For that reason I belong to several computer and management groups and find them useful.

What I was trying to say was that organizations whose very titles reflect racial or sexual segregation policies are offensive to me because they apparently support these philosophies by their existence.

But if indeed these groups purport to solve their members' problems related to bigotry, they have assumed a hopeless task. I do not think there is anything you can do about people who cannot deal with blacks, women or what-have-yous for the simple reason that the problem lies with the dealers rather than the dealees.

That being the case, these organizations may be making matters worse by calling attention to themselves. In my opinion, if women and blacks and Martians would stop rubbing everyone's nose in the fact that they are those things, people would eventually forget about what they are and concern themselves with who they are. Then the problems would just go away.

(P.S. I am one of the above.)
E.G. Johnston
Westminster, Md.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

READER COMMENTARY/Thomas C. Jaycox

Some Predictions The Pundits Skipped

After reading Computerworld's first issue of 1981 and predictions as to what we may expect in the next decade in the way of new computer technology, I was somewhat disappointed. Aside from discussing whether the new IBM 3081 or H series will be recognized as the fourth-generation computer and predicting that we may have to wait another two to three years yet to find out, no one seemed to want to risk making any predictions of substance. The same was true about predicting whether data base machines would replace today's data base software technology.

This may, of course, be because so little of what was predicted for the decade just past actually came true.

I, therefore, am going to make the following off-the-wall, mind-boggling predictions of what we may expect in the next decade, without any regard whatsoever to the risk of being humiliated 10 years hence by being exposed as another nut who did not know whereof he spoke.

Plasma Technology

1. The plasma screen will replace the traditional CRT for display of most textual and graphic (up to 1,024 by 1,024 resolution) information, including color displays. The plasma (flat) screen technology with touch-screen and rear image projection features will finally catch and then surpass the traditional CRT in both price and performance categories.

Display terminals, such as the plasma, will minimize keyboard entry (maybe eliminate it altogether), creating increasing user appeal and accept-

tance. The ability to obtain information, in both text and graphics form, by merely touching any item of interest on a formatted screen menu (as well as enter data of interest in a similar manner) will greatly reduce the need for typing skills, as well as minimize the number of errors inherent in keyboard entry.

In addition, the rear projection features of the plasma screen technology will add yet another dimension to the terminals of the future. The ability to project images from 35 mm slide or mirofiche (and eventually motion picture film or videotape) onto a screen that can also contain computer-generated text and graphics will completely overshadow the present display characteristics of the CRT.

Whether the information you are seeking has to do with a person, place or thing, no longer need you be satisfied with a narrative description only or with limited graphics representations. For example, if you'd like to see a picture of the person that corresponds to the resume or skills profile appearing on the screen, it is yours. If a detective would like to see the mug shot or fingerprint record of a corresponding suspect's description appearing on the screen, he's got it. If the potential home buyer wants to see pictures (both interior and exterior) corresponding to the description appearing on the screen, there it is. If an engineer wants to see a picture of a drawing, a printed circuit board or a factory layout, it's his for the asking.

Most, if not all this information (including pictures) will be obtained by

(Continued on Page 65)

HUMAN CONNECTION/Jack Stone

Beware of Personnel Documentation Standards

When we DPers talk of the burden of documentation, we almost always refer to the writings on systems design and implementation matters and rarely discuss other documentation required of the computer center, such as mission statements, job descriptions and performance appraisals.

Many of us appreciate that these materials represent a large data base that requires a considerable expenditure of resources for its generation and maintenance. But they are essential for proper personnel administration and are needed in the computer center now more than ever; what's worse, computer center management is responsible for ensuring that this material is — to coin a phrase — complete, accurate and timely. Sometimes, though, this documentation support effort can become burdensome, if not awesome, and DP management is well-advised to make sure it doesn't get out of hand, as it did in the case of a recent client of mine.

For many months now, I have been involved as a consultant in a comprehensive reorganization of an end-user department within a very large firm.

The firm's project manager originally asked me to review and evaluate the effectiveness of departmental information system support as part of the effort; however, after he discovered that I possessed a portable word processor plus a modest way with words, my machine and my verbosity were quickly tossed into the process of generating new organization documentation for the department.

Because this material will be used later as a model to upgrade the documentation for other operating departments, including the computer center, I thought that my experience could be useful to computer center managers who may be facing a similar problem (and do not wish to lose their sanity altogether in solving it.)

To his credit, my project manager was determined to do the job right and insisted on an accurate, well-written set of mission statements, plus job descriptions for current positions and new ones to round out career ladders for all job classifications. This was wonderful, until I saw that the documentation standards required infinitely detailed mission statements and

THE TAYLOR REPORT/Alan Taylor

New Systems Could Prove Boon for Teamwork

Imagine a department manager's display that provides simultaneous monitoring controls on departmental actions and progress as well as processing and evaluations of current and hypothetical situations. And, imagine that it keeps the manager informed about the content of mail sent just seconds before by other management team members, while also giving him the time and space to keep diaries, reminding him of appointments, helping him watch budgets and suggesting personal income tax opportunities!

Imagine a firm with such team management capabilities available to its department heads, both line and staff, allowing them to access hundreds of data items from the DP files simultaneously as the occasion arises.

These services are rather different from those usually provided today and could change the operation of management teams rather considerably.

"Team computers" of this nature are coming, and Apollo Computers, Inc., a firm not yet one year old, has demonstrated the possibilities with its first product.

The Apollo computer almost requires the use of techniques that are as dissimilar from today's methods as interactive processing is from batch. And those techniques, notably ring architecture and multiple concurrent-node processing, add up to a new way of using computers that is particularly suitable for corporate management teams as well as the research and development teams for which the system is currently geared.

Consider a management team consisting of a production manager, a marketing manager, a finance manager

and a personnel manager. Suppose each manager has one of the Apollo nodes and that another node is occupied by a DP management staff assistant who has been able to produce and maintain all the appropriate programs.

Independent Operations

Under Apollo, each office could control its operations on as many terminals as necessary, with the terminals specialized for particular functions, including departmental supervisory ones. The order department would continue to operate just as it formerly had, bringing in orders, answering delivery queries, doing credit checks and so on.

Manufacturing would use its terminals for creating production orders, ensuring materials were on hand and doing the many related, detailed tasks; similarly, the other departments would go about their independent tasks, much as they had. At this level, no change would be evident.

The departments might even retain some of their old hardware, software and application systems, although they would be logically slaved off or connected to the Apollo ring connecting the team members.

With the system, the operational method of the team would be the most important difference.

Team-Member Operation

In finance, for instance, the financial team member could have some eight or 16 programs running concurrently — not just two or three. And this capability is based on the system's current stage of development; by the time it is

(Continued on Page 66)

even more detail for each job description (although, to be sure, the job description includes performance measurement factors).

To give you a perspective on the size of the task, there were nearly 100 job descriptions to be prepared, and the one for the lowest grade secretary was six single-spaced typewritten pages, or about 2,500 words. So when I began the work, I found myself facing (somewhat cataclysmically) the prospect of generating nearly 250,000 words within only a few months' time! (It nearly drove me up a wall, but the job was done on time.)

Ridiculous Standards

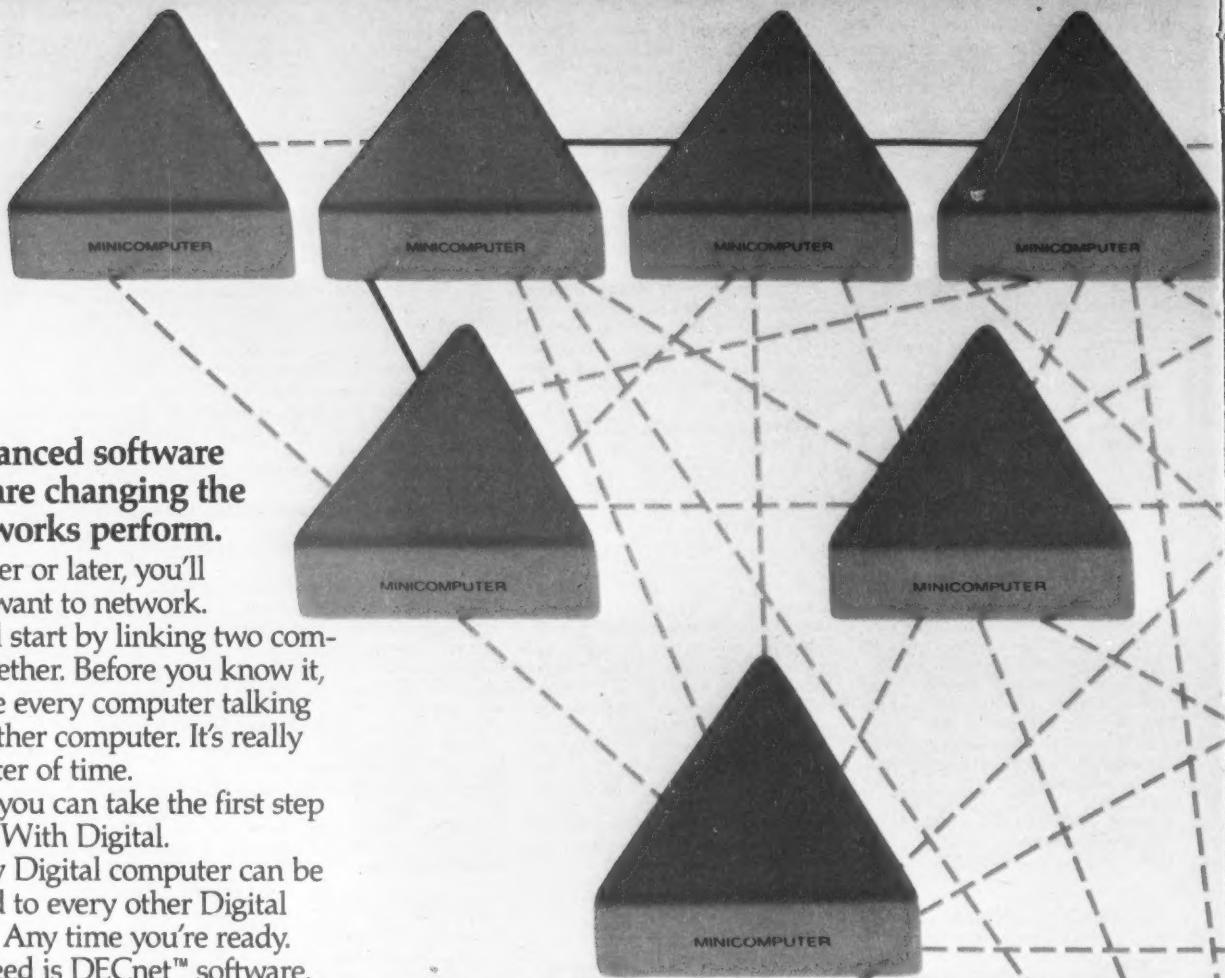
One doesn't have to be the dean of the Harvard School of Business to figure out that the documentation standards for this operation are patently ridiculous. The continuing and massive efforts involved in maintaining the material will be bad enough, but then I have grave concerns that the incumbents can even come close to fulfilling the job specifications (or, in some cases, even understanding them).

But this task is peanuts compared with the one I'm facing now. The project manager wants key job factors identified and five levels of performance standards constructed for each factor — which translates into 25 items for each job description, about 2,500 in all!

Of course, the real losers under these circumstances are not the managers, who probably will find enough excuses to delay the personnel documentation nightmare indefinitely, nor the consultants who, after all, are paid for their efforts (maybe not enough for my current task). The losers are the employees who are forced to work hard and long, knowing full well that there is no complete agreement as to 1) what they are really supposed to be doing (other than daily assignments), 2) how their performance is to be measured and 3) how the job descriptions and performance appraisals can be handled simply and effectively.

As we are finding out the hard and expensive way, salaries alone will not keep skilled DPers on board under such meager personnel management circumstances.

Nobody networks



Our advanced software options are changing the way networks perform.

Sooner or later, you'll probably want to network.

You'll start by linking two computers together. Before you know it, you'll have every computer talking to every other computer. It's really just a matter of time.

And you can take the first step right now. With Digital.

Every Digital computer can be networked to every other Digital computer. Any time you're ready. All you need is DECnet™ software.

And Digital's networking software is exceptional. No other vendor can match us for sheer breadth of flexible, cost-effective networking alternatives. Besides standard networking capabilities, consider these Digital options.

Adaptive Routing. It's not necessary to physically connect every computer to every other computer. This reduces line costs. At the same time, network operations can continue even when communications links break down. Information is automatically rerouted around problem areas.

Network Command Terminals. You can control remote computers and remote applications from any location.

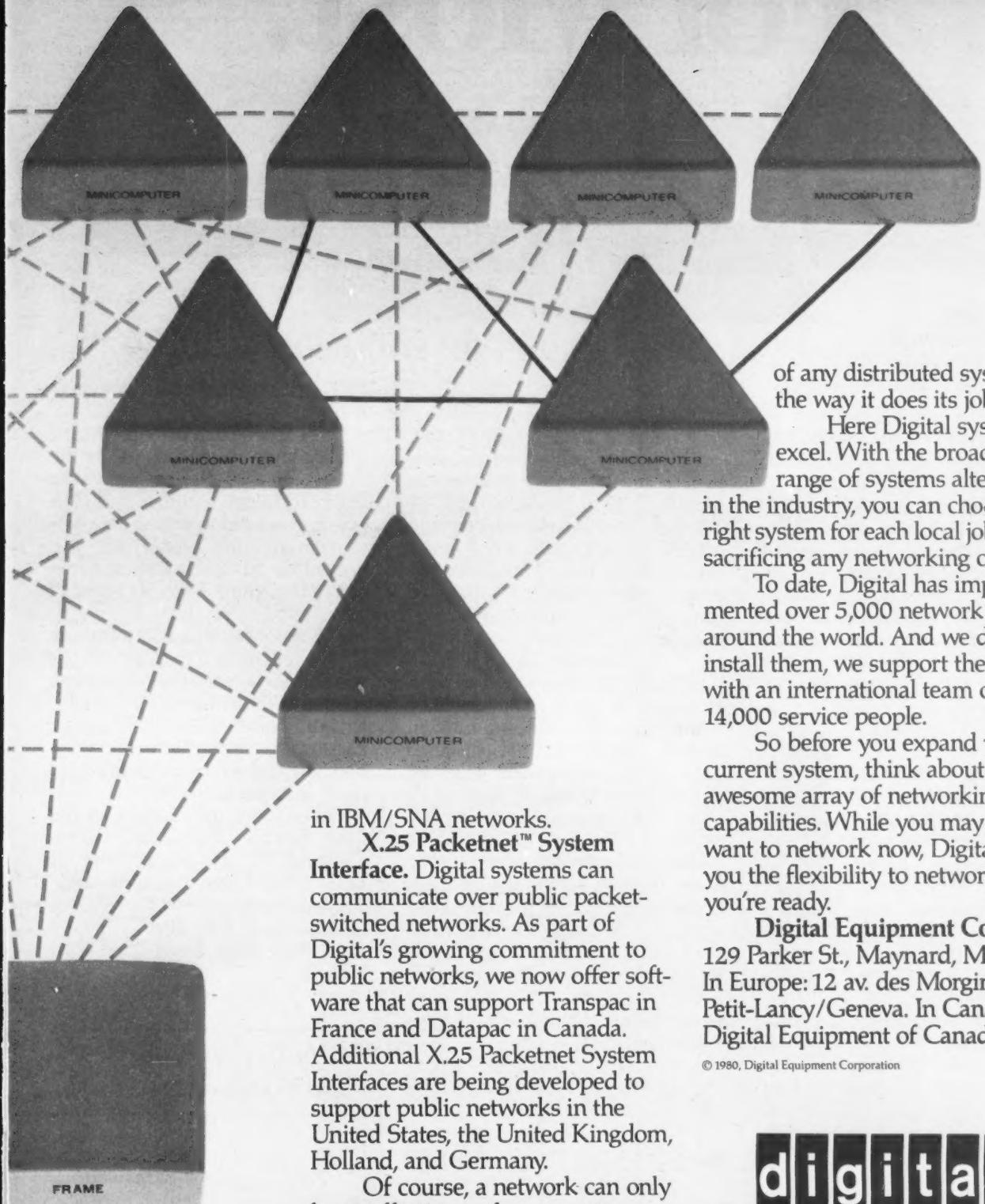
Enhanced Network Management. Control is the key to cost savings. DECnet lets you control the use of each communication line. Lets you add new systems to your network whenever you want without shutting down operations.

Multipoint Communications. Now one communication line can serve several Digital nodes simultaneously, reducing your line costs considerably.

Advanced Protocol Emulators. In addition to supporting Batch BISYNC, Interactive BISYNC, and other standard mainframe communications protocols, Digital offers an advanced SNA protocol emulator, so Digital systems can participate



like Digital.



in IBM/SNA networks.

X.25 Packetnet™ System

Interface. Digital systems can communicate over public packet-switched networks. As part of Digital's growing commitment to public networks, we now offer software that can support Transpac in France and Datapac in Canada. Additional X.25 Packetnet System Interfaces are being developed to support public networks in the United States, the United Kingdom, Holland, and Germany.

Of course, a network can only be as effective as the computers within it. After all, most systems only use their networking capability 20 percent of the time. The real test

of any distributed system is the way it does its job.

Here Digital systems excel. With the broadest range of systems alternatives in the industry, you can choose the right system for each local job, without sacrificing any networking options.

To date, Digital has implemented over 5,000 network nodes around the world. And we don't just install them, we support them, too, with an international team of over 14,000 service people.

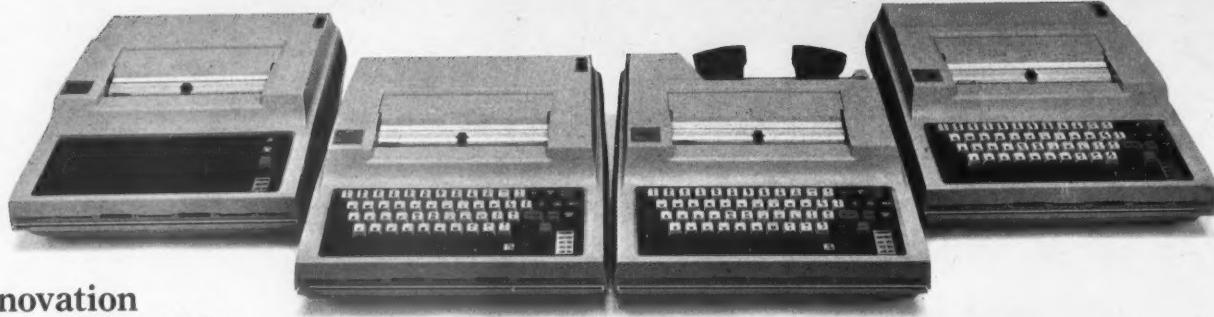
So before you expand your current system, think about Digital's awesome array of networking capabilities. While you may not want to network now, Digital gives you the flexibility to network when you're ready.

Digital Equipment Corporation,
129 Parker St., Maynard, MA 01754.
In Europe: 12 av. des Morgines, 1213
Petit-Lancy/Geneva. In Canada:
Digital Equipment of Canada, Ltd.

© 1980, Digital Equipment Corporation

digital
We change the way
the world thinks.

First and For Most.



Innovation comes first with TI's 780 Series.

State-of-the-art technology is what makes TI's *Silent 700** 780 Series Electronic Data Terminal Family ideal for almost any application. These versatile terminals are real innovators when it comes to improving productivity and reducing communications costs.

Every model in the four-member 780 family features speedy 120 character-per-second thermal printing, TI's field-proven reliability and virtually silent performance.

The attractive, desktop Model 781 Receive-Only Printer and the compact 783 Keyboard Send-Receive Data Terminal are lightweight champions. For high output demand printing, the 781 RO speeds through the toughest printing tasks and features a 1545-character receive buffer to prevent data overflow. Along with its speedy capabilities, the reliable 783 features a full upper and lower case keyboard for simplified local or remote data entry in commercial input/output



applications.

Imagine data terminals that not only offer you speed and versatility, but intelligent modems as well. Both TI's Models 785 and 787 Portable Data Terminals, weighing only 17 pounds each, are a smart choice. With their built-in intelligent modems, these responsive terminals can improve your communications efficiency.

The portable 785 offers an internal originate-only dual modem, and is capable of providing communications via its built-in acoustic coupler over normal phone lines with remote Bell 113A or Vadic 3400 modems. With the 787's unique triple modem, compatibility with Bell 103A, Bell 212A or Vadic 3400 modems allows you to achieve multi-speed communications via direct connection to a standard telephone data jack. And, both terminals feature automatic modem selection to determine the correct modem type, while automatic speed selection insures optimum transmission rates.

For any application requiring speed, input/output capabilities or intelligent modems, TI's

780 Series offers you innovation at its best.

TI is dedicated to producing quality, innovative products like the *Silent 700* 780 Series Electronic Data Terminal Family. And TI's hundreds of thousands of data terminals shipped worldwide are backed by the technology and reliability that come from 50 years of experience.

Supporting TI's data terminals is the technical expertise of our worldwide organization of factory-trained sales and service representatives, and TI-CARE[†], our nationwide automated service dispatching and field service management information system.

For more information on the 780 Series Electronic Data Terminal Family, contact the TI sales office nearest you or write Texas Instruments Incorporated, P.O. Box 1444, M/S 7884, Houston, Texas 77001, or phone (713)373-1050.



*We put computing
within everyone's reach.*

TEXAS INSTRUMENTS
INCORPORATED

In Canada, write Texas Instruments Incorporated, 41 Shelley Rd., Richmond Hill, Ontario L4C 5G4, (416) 884-9181. In Europe, write Texas Instruments, M/S 74, B.P.5, Villeneuve-Loubet, 06270, France, (93) 20 01 01. In Asia Pacific, write Texas Instruments Asia Ltd., 990 Bendeemer Rd., Singapore 1233. Telex RS 21399, or phone 2581122.

*Trademark of Texas Instruments †Service Mark of Texas Instruments Copyright © 1981, Texas Instruments Incorporated

Algorithm Not Useless

In reference to Hanley Strappman's letter [CW, Dec. 29-Jan. 5], the algorithm for packing five characters in a 24-bit word is *not* useless. It was, in fact, used to store account passwords in ComShare's "W" series systems on the XDS 940 in the early '60s.

The object? Security. A system "browser" who bypassed other safeguards to achieve a "dump" found nothing that looked like Ascii character passwords.

Barry Paulson

Galesburg, Ill.

Too Restricted

Once again, Computerworld and Datapro Research Corp. have pulled off an excellent survey [CW, Dec. 22].

However, I noticed something this year I had apparently missed — or rather, not missed — before. The subject was really rather restricted. Missing from the survey were such popular and important software products as Fortran, Lisp, Plato, Coursewriter and

LETTERS

Nastran. (Sorry if I left out anyone's favorite.)

Or is it possible I'm the only subscriber in a nonbusiness field?

Doug Pearson
Mountain View, Calif.

Using a VDP 1000?

I would like to hear from other users of Lear Siegler, Inc. VDP 1000 computers, using the VMOS operating system and Basic language.

I am the only user in South Africa and would like to exchange experiences.

My address is 24 Douglas Road, Bedfordview 2008, South Africa.

C.L.Kidson
Bedfordview, South Africa

Measure Results

I just finished reading the Human

Connection article by Jack Stone entitled "How Good Is Your Personnel Appraisal?" [CW, Dec. 29-Jan. 5].

I agree with the majority of the article except for Stone's statements that personnel appraisals can never be totally objective and that performance standards should include subjective factors.

It is well known that throughout the industry a well-defined and objective individual performance measurement technique is lacking. It must be realized that one of the most important assets in any organization are its people. Why is it, then, that most employees are faced with one person's subjective opinion when their performance levels are determined? This subjectiveness, in most cases, is unfair to the employee and can affect on his compensation.

All of us, at one time or another, have sat down with our superiors at review time and disagreed on some area of the

I would like to take Stone's article one step further in detail. For measurement purposes, I feel that emphasis should be placed on the result rather than the process. My feeling is that results should be measured for performance. This philosophy is very consistent with all objectives. For example, a corporate objective, to earn profits, can best be measured by identifying the profits rather than how the profits were made. Another example: If you tell a programmer to write a program that will list a name and address file in alphabetical order and you need it by Friday, what difference does it make what language it is written in as long as you get what you want by Friday?

In summary, there is no room for subjectiveness in personnel appraisals. If it cannot be measured, it cannot be managed or controlled.

As a DP manager, I have developed a fool-proof individual objective measurement system for my subordinates and would be happy to share it with others at their request.

Wayne Whiteside

Fremont, Calif.

More Predictions on Next Decade

(Continued from Page 61)
merely touching the screen to direct the computer to search out, retrieve and display that information.

As for Data Base . . .

2. My second prediction is that data base technology, as we know it today, will not even exist 10 years from now. The failure of data base systems in the past decade (owing mostly to their complexity) coupled with the ever-increasing size and decreasing costs of core memory and a continued proliferation of distributed processing systems (both mini and micro), will completely negate the need that existed 10 years ago. At that time, memory had to be conserved through better file organization and minimal data redundancy. That would, in turn, bring about faster response times.

Even today, a properly coded application program, under a high priority (but not necessarily the highest), running in the batch mode with output directed back to the user terminal can often beat the response time of the most sophisticated on-line, interactive data base system.

Don't get me wrong — there will still be a need for data base systems 10 years from now, but they will be completely different from those we know today.

In the Home

3. My third and final prediction has to do with more and more home computer usage in the next decade. Not only will you be playing games, keeping your household budget, doing your shopping, banking and bill-paying by home computer, but you will also be getting the latest news, stock market quotes and weather reports the same way.

The home computer will be regulating all appliances, as well as heating and lighting to conserve energy. It will also protect your home from fire or crime via interface to the local fire and police departments. If this were not enough, you will also be competing on TV game shows like "Family Fued" and "Let's Make a Deal" from the comfort of your own home. You may also play bridge, pinocle, chess or

checkers with people on the other side of the country.

And at the end of a hard day's work, you can come home, fix yourself a martini, sit in your recliner and lower a microphone-equipped helmet over your head. Then, when the voice coming over the headset asks who are you, you respond with, "I am Captain Kirk of the Starship Enterprise. What is my mission?"

You are given a mission to proceed immediately to the Cosmos Galaxy and engage a fleet of 27 enemy Klingons that are fast approaching the federation for purposes of destroying it. With the signaling of your acceptance of the mission, you are immediately transported (via sight and sound) from the reality of your den into outer space.

The preceding predictions are the type I like to read about as regards computer technology in the coming

decade.

Jaycox is a systems analyst for Boeing Computer Services Co. in Seattle.

Computerworld welcomes comments from its readers. Letters should be addressed to Editor, Computerworld, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

MAKE THE RIGHT CONNECTION...

... WITH DATALEASE
In Stock, Ready To Ship
★ LA 120 ★ VT 100
★ DZ 11 ★ DH 11
★ CABLES ★ CONNECTORS
LA 120* VT 100*
ALL AVAILABLE NOW
To Complete Your System Expansion
Call Toll Free 800-854-0350 (Call. 714-632-6986)

DATALEASE R The DEC Specialists ©

Registered Trademark of Digital Equipment Corporation

2770 EAST REGAL PARK DRIVE, ANAHEIM, CA 92806 • TELEX: 682439

ADVANCES IN COMPUTER SECURITY AND PRIVACY MANAGEMENT

- Computer Security and Privacy Update
- Advances in Computer Crime Prevention
- New Directions in Computer Security Technology
- Trends in Disaster Recovery Planning
- Distributed Systems Audit and Control

These are some of the topics that will be covered at the Seventh Annual Honeywell Computer Security and Privacy Symposium to be held April 7-8, 1981 at the famous Pointe Resort, Phoenix, Arizona.

If you have an interest in such questions as: How do you protect proprietary software? or How do you implement a corporate-wide computer secu-



rity strategy? or What audit controls should be built into a distributed system? or What will be the eventual impact of the Foreign Corrupt Practices Act on your information system? . . . You Will Want To Attend This Meeting, or Be Represented. Registration is \$500 and includes lunches and socials.

Send in this coupon or call Jerome Lobel (602) 249-5370. He'll send you the details. (Toll free number is (800) 528-5343.)

Honeywell Information Systems
Jerome Lobel, Manager
Computer Security and Privacy
P.O. Box 6000 (MST-99-4)
Phoenix, Arizona 85005

Please send me more information and a registration form for your April Symposium.

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Honeywell

Systems Could Prove Boon for Teamwork

(Continued from Page 61)
prepared for the business world, this number may be greatly increased.

These programs would include routine ones that would probably never be turned off. Some of these would handle a further level of supervision of the department work, producing periodic totals, comparisons with forecasts and so forth.

In Apollo terminology, these programs would be kept on as an "Object" and would be available for use by any of the other programs, by any appropriate team member.

They could also be "windowed." In Apollo terminology, a window is any area of what we would normally call a file. The output of a process, an invoice, the time of day, the status of

some variable or a graphic display can all be called windows.

These windows can each be placed on a "pad" that has the same dimensions as the display output and control area. The difference now is that the information has a defined position on the display and defined display characteristics. With both the data and the positioning material on the pads, priority-sequence step is used to bring them to the display.

Pack of Pads

The pads are rather like a pack of cards, each providing a complete definition of a display and able to be shuffled at will. Each area of the display shows anything that the top pad asks to be displayed, and any area that is

not used by the top "card" or pad then displays matter from the next pad, and so on and so on.

Apollo currently expects only about the top five or six pads to be used to provide displays, but this seems to be very dependent upon the applications.

One of the difficulties in evaluating how much information this setup provides comes from the fact that implicit, as well as explicit, information is present.

For instance, suppose one pad produced by the electronic mail system, for instance, were to be the words "NEW MAIL RECEIVED" in a position on the top right of the screen. Another pad might use the same position for "STAFF MEETING - IN FIVE MINUTES." And the time of day

might well use the same position for its display, as well.

If the priority of the three pads were set with staff meeting first and time of day last, a display of time would also mean that there was no staff meeting coming and that no mail was waiting for attention. Management-by-exception thinking can be used here.

And at the same time, the rest of the screen would be providing different sets of information, photos or what have you from the other pads.

The display becomes a monitoring and control panel, with potentially as many different events or pieces of information being reported or provided as are requested.

With these display possibilities and the ability to evaluate, report and generally back up management decision-making, Apollo-type systems could be important new tools for management teams.

© Copyright 1981 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for noncommercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

LETTERS

Not Only Conclusions

Dr. Robert Parslow chided me for ignoring the facts surrounding his predictions about the computer's alleged degradation of the quality of life [CW, Nov. 3, Dec. 8, Dec. 29].

I do not believe that I am unaware of the social conditions and trends he attempted to explain. However, I also do not believe that his conclusions, even if they are based on evident data, are the only ones that can be drawn from the available evidence.

I apologize to Dr. Parslow if that appears to him as an attack on his integrity.

Reinhard Mirkovich
Lowell, Mass.

Listen to Operators

The letters about "The Silencing of a Computer Room" [CW, Nov. 17] ignored the point that the computer operator's knowledge is a resource that should not be ignored. The operators are the people who get the job done and who know the machine operations best. They don't need unnecessary work.

The programmer should have listened to the operator because the saving of runtime (CPU or elapsed time) is a benefit to the company. Sometimes things done when bringing up a new system are not necessary once the system is operational.

Proposed changes should be in writing, and management should answer in writing.

However, most managers won't describe their operations' obvious flaws in writing.

In addition, management's answer should be discussed with the operator.

It has been my experience (20 years in DP) that when a programmer won't listen to an operator, there is a large ego in the way.

Bob Regester

Pleasant Hill, Calif.

Significant Figures (000 omitted)	
For the Year	
Premiums earned	\$338,150
Underwriting income (loss)	\$32,775
Investment income net of expenses	\$304,217
Net operating income after taxes	(\$2,261)
Realized investment gains (losses) after taxes	(\$13,854)
Extraordinary item	37,136
Net income	27,020
Composite ratio	38,957
Average shares outstanding	17,054
	128.4
	7.8%
	83.7
	27.2
	43.8%
	103.8%
	99.8%

ASI-ST does most of the work; YOU reap the profit!

Easy to Use

More organizations are using ASI-ST more heavily than any other data management and report writer system. Why? Because ASI-ST is so easy to work with. You simply enter language statements and parameters; there are few rules to learn and remember. You can even omit many parameters entirely; ASI-ST picks the most commonly selected condition for those entries.

By eliminating up to 90 percent of the programming effort usually required to perform data management functions, ASI-ST is saving time and money for hundreds of users. Typical examples:

- COMBUSTION ENGINEERING, INC. (CE) currently executes from 18,000 to 22,000 ASI-ST runs every month. Some runs produce more than 100 reports in a single pass of one or more TOTAL data bases and conventional files.
- Using ASI-ST, AMERICAN EXPRESS COMPANY recently required only four minutes of CPU time to process over 12 million records. AMEX also uses ASI-ST with IMS.
- CORNING GLASS WORKS now executes an average of more than 18,000 ASI-ST runs monthly against IMS and TOTAL data bases and standard files.
- UNION CARBIDE's usage of ASI-ST averages over 9,000 runs per month at each of its worldwide data centers where ASI-ST is used with IMS.

Uses Less Machine Time

Although not originally intended to replace higher-level computer languages, ASI-ST can solve 70 to 90 percent of your commercial data processing problems. And ASI-ST can process your IMS or TOTAL data bases more economically — because it uses less machine time. In a single run, for example, ASI-ST creates and updates related or independent files; retrieves, manipulates, calculates, and displays data; and generates detail and summary reports. How's that for versatility — and efficiency?

Hardware and Operating Environments

- IBM 43XX, IBM 30XX
- IBM 360/370, AMDAHL, ITEL
- OS/MVS, OS/VSI, OS/VS2
- DOS, DOS/VS, DOS/VSE

For complete time- and money-saving details on ASI-ST, call or write today.

Applications Software, Inc.
21515 Hawthorne Boulevard
Torrance, CA 90503
(213) 540-0111

Member SIA Software Industry Association

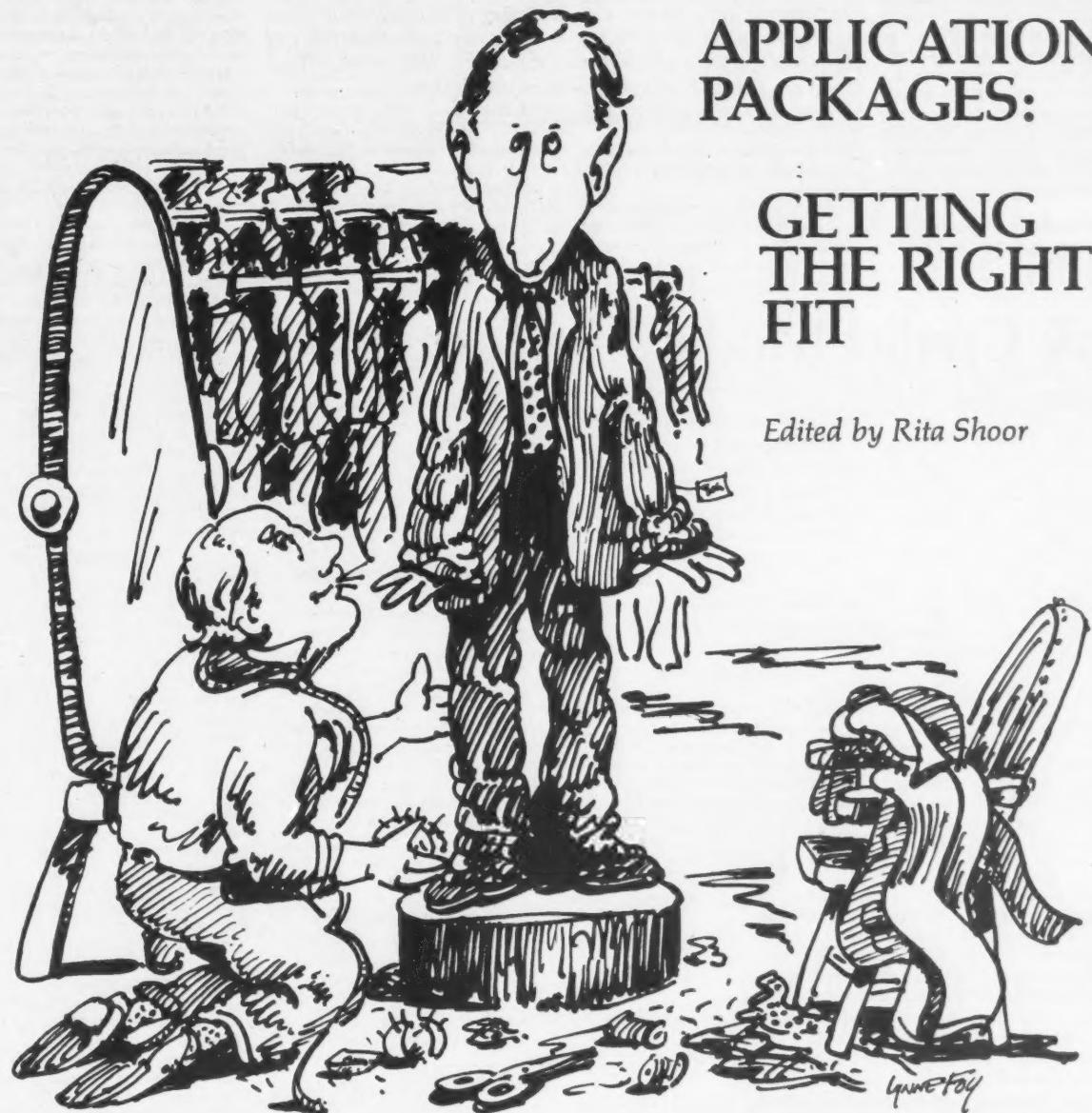
January 26, 1981

SPECIAL REPORT

APPLICATION PACKAGES:

GETTING THE RIGHT FIT

Edited by Rita Shoor



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

SPECIAL REPORT

New Products Sighted

Applications Packages Verging on Second Age

By C.C. Dillaway

Special to CW

STROUD, GLOUCESTERSHIRE, England — If the evolution and development of products is considered to take place in generations, then commercial applications packages have probably not yet entered their second generation.

A generation is complete when its lessons have been learned and are ready for incorporation into newly developed products. Since most commercial applications packages are enhanced versions of systems originally developed for a specific requirement, there is little evidence of earlier learning being incorporated into new products.

New generations of products are expected to emerge in the marketplace sometime in 1983. By then, the existing products will have captured most

of the possible first-time users and the earliest users will be seeking more satisfactory replacement products.

cessful use.

However, the fallacy of this thought is revealed if the commercial applica-

While computer hardware may be verging on its fourth generation, applications packages have yet to enter their second phase of development, according to C.C. Dillaway. The British consultant pointed out some elements to look for in applications software of the future during a speech before the commercial special interest group at a Digital Equipment Corp. users' meeting.

The new products will consist of elemental design specified by a set of coherent entries.

It is true that users' requirements in the same application area usually vary. This argument is often used to dispute the possibility of commercial application packages having a wide and suc-

tions area is examined in finer detail. In any one commercial applications area, there is only a finite number of different elemental functions even if each user has his own mix of these elemental functions. The number of separate elemental functions spread among multiple users gives the ap-

pearance of an infinite number of different requirements.

At this relatively early stage in the life of commercial applications package development, it is difficult to discern what these elemental functions are. However, it should eventually be possible to specify the elemental functions and develop methods by which they can be brought together in those combinations that a user requires.

The selection of a user's requirements from all those elemental facilities provided in a package is by means of parameter entries. As additional facilities are required by market-place demands, they are added to software packages under the control of appropriate parameter entries.

It is inevitable that after a few years of use and evolutionary enhancement, more parameter-controlled facilities will have been added to the package than were available on its original release. As these facilities are added, they often receive a different treatment from those in the package originally provided.

The effect is that similar types of specification entry will be implemented in different ways. This results in parameter entries that do not present a coherent whole to the user. He is faced with learning several different ways of implementing similar functions.

Design Objectives

Few packages have as yet been designed as an enhancible whole from inception, and this piecemeal implementation can be observed in the way the package facilities are specified.

Simplicity, power and flexibility are the design objectives of any commercial application package.

Simplicity may be defined by stating that it is achieved by those packages with the lowest number of parts. A "part" in this context includes everything from the number of different forms used through the number of programs supplied to the number of parameter entries permitted.

Power belongs to any package that covers more of the application area than might be covered by a competitive product. Few users require a package with facilities for meeting every conceivable requirement in an application area. However, most users will need several of the application's fringe requirements.

A package should cover all of these fringe requirements so that the particular requirements of each of the package's users may be met. When the features of two packages are compared, one may be found to be more powerful than the other through an examination of the features it covers.

Flexibility is the software's ability to meet the changing requirements of its many users. A flexible package can be adapted to meet alternative processing methods within one of the major requirements of the applications area served by the package.

Dillaway is an independent consultant who specializes in all areas tied to commercial applications software packages.

Bank Credits Model's Performance

By Richard S. Stefka

Special to CW

CLEVELAND — Prior to 1970, planning for most companies did not require extensive effort. In many instances, planning added up to the organization's response to a simple upward linear trend.

Times have changed with planners referring to the late 1960s and the decade of the '70s as the "age of discontinuity." Terms like "inflation" and "recession" took on new meanings, and new words like "stagflation" were coined.

Economists attempted to explain these rapid changes with econometrics — the use of mathematical and statistical methods to develop economic theories. Computer technology greatly facilitated major advances in econometric applications and many people realized that models could be built for in-

Inflation, recession, stagflation — the economists who guide companies through these troubled waters increasingly rely on computer software to help with econometric modeling. Stefka describes the series of decisions at Ameritrust Corp. that led to implementing one of the application packages designed for statistical analysis.

dividual organizations as well as for the national economy.

Ten years ago, Ameritrust Corp., a multibank holding company with consolidated assets of \$5.4 billion, developed its first computer model.

The model was built with Basic and

Fortran through a time-sharing service using a teletype machine. It suffered from the problems associated with Basic, Fortran and similar languages: documentation, complex logic and a general lack of user-oriented features. A trained programmer was almost a necessity because of these considerations.

While software for modeling was being developed, the firm also created data bases to support the modeling function. After two years, the model was rewritten on a system from a time-sharing services company. It provided a high-level user-oriented language, time-series exogenous variables, a macro model of the economy, and any required programming support personnel.

Then, four events occurred to prompt rethinking the model. First, at

(Continued on SR/4)

Inside

Applications Packages Verging on Second Age

Bank Credits Model's Performance	SR/2
Applications Software Rated Tops in Growth	SR/2
Independents See 33% Gain in '80 Revenues	SR/3
1980s: Decade for Prudent Software Purchasing	SR/3
Demise of Unethical Software Hustler Predicted	SR/5
Get Contract Copies Early, Buyers Told	SR/6
Package Design Must Provide for Flexibility	SR/6
Minimal Contact Marketing Cuts Hidden Costs	SR/7
Five-Year Advances in Manufacturing Sighted	SR/8
Hazy Distinctions Cleared for Software Buyer	SR/10
Prop. 13 Pushes Oregon County to Revamp	SR/11
Without Right Software, CPUs Just Dead Metal	SR/13
Package Justified Despite 3,000-Line Update	SR/14
Laboratory Software Revives Hospital Revenues	SR/15
Package's Integrated Design Attracts Boeing Managers	SR/18
End-User-Developed Tool Put to Work at Boeing	SR/20
General Mills Adopts Ledger Package With Ease	SR/21
CPU Firm Finds Tailored Software Best Option	SR/22
Three Steps Can Help See Projects to Fruition	SR/24
Bankers Give Positive Accounts of 'IPS-One'	SR/25
Manufacturing Package Gives Trio of Benefits	SR/26
Accounts Payable Package Beats 150 Rivals	SR/27
Software Smooths Utility's Shareholder Activity	SR/29

SPECIAL REPORT

Applications Software Rated Tops in Growth

By Carol Weizmann
And Cary Morrill

Special to CW

WALTHAM, Mass. — Applications software packages continue to outstrip both utility and systems packages in terms of market growth, according to the "Independent Packaged Software Reference Book" from International Data Corp. here.

By 1984, applications products are expected to bring in 55% of the independents' package revenues. This market sector is occupied by numerous software houses that concentrate on selling applications systems rather than application routines or subsets.

Many of the software vendors — par-

ticularly those selling only to certain industries or application areas — do not compete among themselves.

"This marketplace," IDC's report pointed out, "has attracted many smaller competitors, and, unlike the systems and utility sectors in which the leading vendors control almost half the market, the major suppliers of applications software account for a little less than a third of total package revenues."

The study identified five major application areas where software packages have been sold successfully: accounting, payroll/personnel, manufacturing, banking/finance and insurance.

Although accounting application packages were among the first avail-

able to users, this market sector is a long way from mature, leased on growth rate. The IDC study anticipated a 32% compounded annual growth in accounting package revenues through 1984.

However, this market's status is signaled by the size and position of its major vendors. Eight suppliers received two-thirds of the revenues generated in this sector in 1979. Leader Management Science America, Inc. boosted its revenues nearly 100% between 1977 and 1979 and most of the other top vendors have doubled size over the two-year period (Figure 1).

Payroll/personnel software package sales are increasing as more managers understand the importance of effec-

tively managing human resources. These application product revenues are expected to grow at about 30% a year through 1984. Among the trends that encourage users to invest in this software are the flood of federal regulations concerning employment practices; the skyrocketing cost of labor and benefits; and the need to provide software for non-IBM hardware with an emphasis on minicomputers.

With Martin Marietta Data Systems, Inc. claiming 34% of sector revenues, approximately six suppliers control nearly 60% of market share in the manufacturing software sector (Figure 2). Virtually all of these firms have realized enormous growth recently, al-

(Continued on SR/4)

Third Parties See 33% Gain In '80 Revenues

WALTHAM, Mass. — Revenues for third-party-supplied software packages grew 33% in 1980 over 1979's \$920 million, according to the "Independent Packaged Software Reference Book" from International Data Corp. (IDC) — and the end is not in sight.

This market is expected to expand at a 29% annual rate through 1984 when revenues may hit \$3.5 billion, according to the market research firm here.

IDC indicated that end users are increasingly receptive to the acceptance of independents as a viable alternative to in-house software development or purchasing software from hardware vendors. It also appears that the independents are responsive to the demand for user-friendly systems based in nonprocedural languages with English-like commands.

The lack of vendor support in terms of training, maintenance and enhancements from some hardware suppliers is another factor that contributes to independent packaged software supplier sales, according to the firm. And the minicomputer market appears to be generating momentum for third-party vendors as users demand software, particularly in the applications area (see story above), for their minis.

However, IDC also saw clouds on the independent supplier horizon. A serious lack of programming personnel appears to be slowing new software development and is forcing some firms into expansion through acquisition rather than through internal development, IDC noted. If this acquisition trend continues, small vendors might experience greater difficulty in surviving in the marketplace.

Competition from hardware vendors also seems to be on the upswing in all software package market sectors, according to the report. Turnkey systems houses are joining hardware firms in a perception of the revenue potential from the software market.

In summary, the software market is definitely on the rise, IDC said. For example, Informatics, Inc. was the only vendor with reported revenues in excess of \$30 million in 1978. But by year-end 1979, both Management Science America, Inc. and Cincom Systems, Inc. reached \$30 million.

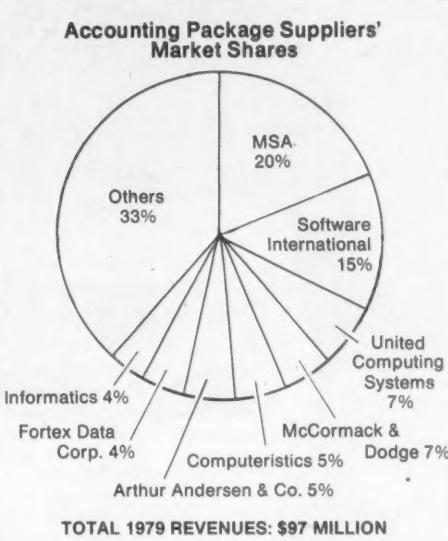


Figure 1

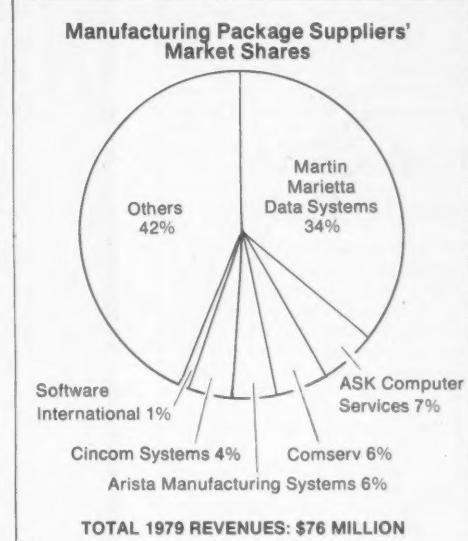


Figure 2

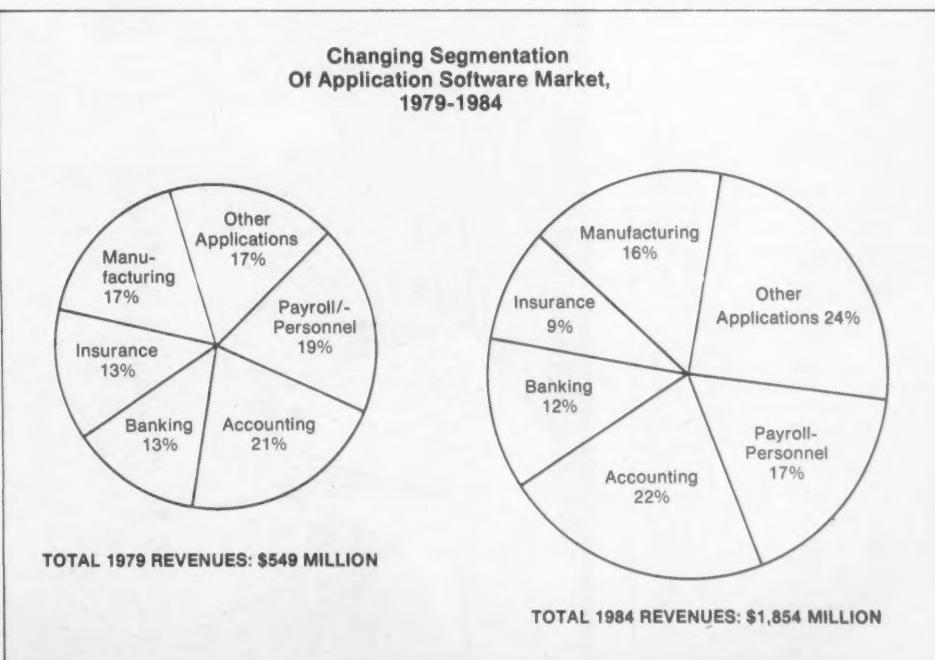


Figure 3

SPECIAL REPORT

Page 4

Applications Software Growth Rated Tops

(Continued from SR/3)
most tripling revenues in the last few years, and IDC projected a 31% a year growth in this market into 1984.

Several factors are expected to contribute to end-user demand for these offerings: the appeal of minicomputers to smaller manufacturing companies that seek an alternative to service bureaus; increasing interest in interactive, integrated manufacturing systems and new applications — shop floor control, for example — and the fact that international markets are opening up.

Although banking and financial firms often utilize in-house development or computer services, the potential for application software packages is good in this area. Although individual suppliers are not expanding as rapidly here as in other applications arenas, a yearly revenue growth of 29% through 1984 is anticipated.

Despite a banking trend toward integrated systems, there is room for ap-

plication packages that address problems generated from ongoing changes in the regulatory and technological milieu. In addition, international banking systems seem to be attracting increasing interest, according to the IDC study.

Independent software package suppliers face relatively slow going in insurance markets. These companies were among the earliest of computer users and seem more likely to develop software in-house or acquire it from the hardware vendors.

A 23% annual growth rate in insurance software package revenues is projected through 1984. Five suppliers

control 60% of the market, with Insurance Systems of America, Inc. boasting a 20% market share.

Influences attracting insurance industry users toward independent software packages include the burgeoning cost of in-house software development; constant changes in the regulatory environment which in turn create new reporting and disclosure requirements; mounting demand for distributed systems that may extend home office functions such as quotations; and list maintenance into the field.

Moreover, property/casualty insurance companies, which are traditionally less automated than life/health

firms but are faced with greater volume in policy and payment transactions and fast-changing regulations, are a promising market for independents.

A strong future for applications software package suppliers in new industry and application areas is also indicated. The report's "other applications" category is expected to grow faster than any other industry sector and account for \$451 million in revenues by 1984 (see Figure 3 on SR/3).

Weiszmann is manager of the services and software information program at IDC. Morrill is research analyst at the same firm.

Bank Credits Model Package

(Continued from SR/2)
least 80% of the model's data requirements included Ameritrust historical financial data; this data had to be manually collected and input prior to running the model. To facilitate the tedious collection and summarization of the data, Ameritrust purchased a software package from SAS Institute, Inc.

Since most of the data already existed, it appeared that if programs written with the Statistical Analysis System (SAS) package could feed the model directly, a superior model could be developed. And after IBM's Time-Sharing Option (TSO) became available throughout the bank, evaluation revealed that SAS was theoretically capable of driving the model.

Time Series Access

Second, the company's chief economist felt that although access to a macro model of the economy was not required, access to the time series was a necessity for analysis. In addition, these time series were needed to update the model's forecasting equations, as well as income and expense equations. These time series were provided by Citibase, a subsidiary of Citicorp, on a monthly or quarterly basis.

Since the economists' function is to analyze and synthesize available economic data, exercise judgment and provide input into planning and investment functions of the bank rather than to out-guess the rest of the nation's economists, Ameritrust felt it could rely on a relatively low-cost forecasting service.

Fourth, since the model had been used extensively for such applications as a top-down check of the annual budgeting process, regular monthly forecasts, long-range planning evaluation and evaluation of balance sheet and structure options, the time-sharing costs approached the six-figure mark.

Stefka is a corporate planning officer with Ameritrust Corp.



SPECIAL REPORT**Especially With DBMS****1980s: Decade for Prudent Software Purchasing**

By Stephen V. Wright

Special to CW

While the 1980s may be the decade of purchased software, it is also going to be the decade for prudent software purchasing, especially if your environment includes a data base management system (DBMS).

Consultants, vendors and end users are all aware of the advantages to be gained when using purchased application software. The list typically includes the money saved by not reinventing the wheel in-house and usually mentions that the purchase of

software allows the DP manager to bypass the problem of finding a new assignment for five extra programmers to do 12 to 15 months from now when the in-house application is completed. The second item applies even though you know that 12 to 15 months from now you won't have to find something for these extra people to do because they will each have a seven-month backlog of program modifications.

But what about the hidden side of purchased software to be used with a DBMS? Processing efficiency is the first factor under consideration. Many

software vendors currently advertise packages as being available for different DBMS. A significant number of these software packages were written when the DBMS concept was not widely used. As a result, most of these applications are designed to work with sequential or lsam data sets.

And, many vendors feel that it is too expensive to rewrite application software in order to make the system compatible with a data base management package. Instead, there is a replacement of the "gets" and "puts" of the application with data base call com-

mands, using the data manipulation language of a particular DBMS. It allows a relatively quick conversion, especially if the input-output statements are isolated in a particular segment of the application.

In many cases where the number of data base records is small or the processing per day is relatively light, this "quick and dirty" conversion process will work reasonably well. However, the user may run into some problems with the very large data base systems which are more typical in any heavily utilized application.

Converted Process

An example might be a large, diversified corporation that has replaced five personnel application systems and data files with one centrally located data base management file and a purchased personnel application software package. The package might locate data in the personnel system by sequentially passing through one record at a time until the correct record is found. If each of the five divisional systems had 20,000 to 30,000 people in its particular master file, the result would be a data base of 100,000 to 150,000 records when the systems and data were combined. A sample request might be to find the employees with Ph.D.s in chemical engineering. If there are just three employees with this characteristic at this particular company, a search is going to be conducted for three records in a data base of 100,000 to 150,000 records. Since the application package was designed to read data sequentially, there is a possibility of accessing more than 149,997 records in order to find the three valid records.

Contrast this converted application to a system designed to use the DBMS efficiently. It would probably use the more powerful data manipulation language supplied by the vendor to look for those three records rather than sequentially passing through each record in the data base. With an inverted data base, for example, the search for the three records would take place in the associator or index of the data base, and the records would be found relatively quickly since the application program would search through the index of the records rather than the actual data records themselves. Therefore, a search that might take a converted system a minute or more would take only a few seconds in a system that was written to work with a particular DBMS.

Recovery Factor

Recovery is another factor to consider when selecting application software to run with a DBMS. When an application system runs with a sequential file, recovery from a system crash is accomplished by reloading a copy of that file from tape to disk and starting the program over again.

This recovery method is not available with most DBMS. Instead, DBMS software utilizes checkpoints where all updating to the data base is temporarily suspended. Then, the system writes

Key to Success

Intel's integrated dictionary unlocks data management solutions.

Programmer productivity.
Application development. Data base design. Project management. Programming standards. Maintenance. Data security, accuracy, integrity. Optimization of resources. Controlled growth.

All of these are priority issues among forward-thinking organizations today. But these are just a few of the issues addressed—and solved—by Intel's Information Resource Management product family.

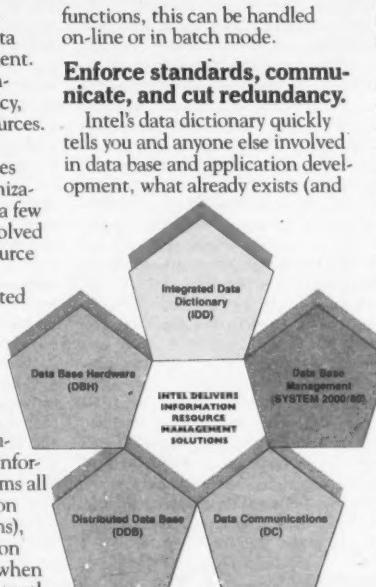
The key is in Intel's Integrated Data Dictionary, IDD.

Get the big picture.

The IDD gives you a detailed, panoramic view of what's happening in your data base environment. By continually monitoring and tracking information (ranging from data items all the way up to entire application systems with multiple programs), Intel's dictionary puts reports on who, what, where, how, and when at your fingertips. Most importantly, you won't need a crystal ball to forecast the impact of change. Impact reports are standard, too.

Streamline application development.

With a wealth of vital information in hand, you can simplify the task of building and fine-tuning new applications. And because the dictionary works intimately with SYSTEM 2000®/80, Intel's powerful data base management system, designers are given extensive data modeling and application prototyping capabilities. Moreover, data items, records, and definitions are easily added, deleted, or modified even after a data base is in full production. And, like all IDD



in what form it exists) in your environment. Additionally, the dictionary applies editing, error detection, and correction functions.

Guarantee data security.

Watchdog of your data is IDD's sophisticated security system. With passwords which protect data as far down as the item level, you can be confident that your data remains "clean." You can be confident that unauthorized personnel will not accidentally alter or view sensitive information.

Implement successful solutions.

Intel's Integrated Data Dictionary is an application design aid, a documentation vehicle, a way to enforce standards and procedures, a master reference for determining the impact of change, a tool for controlling growth today and tomorrow.

To examine your key to success with Intel's IDD and other Information Resource Management products, clip the coupon below or call our Market Information Office at 512/258-5171. We'll respond with descriptive brochures, success stories about our customers, plus an invitation to our complimentary seminars on Information Resource Management.

intel delivers solutions.

Europe: Intel Semiconductor (Nederland) B.V., Commercial Systems Division, Oranjestraat 1, 3441 Ax Woerden, The Netherlands, 31/3480-1264, Telex 47970 CSD NL.

Canada: Intel Semiconductor of Canada, Ltd., 201 Consumers Rd., Suite 200, Willowdale, Ontario M2J 4G8, 416/494-6831

Please forward literature on Intel's Integrated Data Dictionary and other IRM products.

Name _____

Company _____

Mailing address _____

City, State, Zip _____

Telephone () _____

Mainframe(s) installed: IBM (compatible)
_____, CDC_____, Univac_____;

Operating system _____

Return to: Intel Commercial Systems Division
P.O. Box 9968; Austin, Texas 78766
ATTN: Market Information Office

CW 1/26/81

(Continued on SR/6)

SPECIAL REPORT

Long-Term Sales Programs Sought

Demise of Unethical Software Hustler Predicted

PENNSAUKEN, N.J. — The prudent applications package customer should probably maintain a certain amount of skepticism when confronted by an enthusiastic software salesman, but the likelihood of being hustled by an unethical salesman in today's marketplace has been "vastly diminished," according to a report on "Software Package Selection and Acquisition" from Auerbach Publishers, Inc.

Most software vendors recognize that potential damage to a long-term

sales program from a poorly placed sale is greater than the immediate benefit from any specific sale, author Albert C. Lowenstein from Data Interface Systems Corp. said.

Personnel in purchasing organizations increasingly perceive the need for thorough requirements analysis and package evaluation as software marketing becomes more commonplace.

Still, he recommended that purchasers keep in mind that their procurement cycle is essentially a sales cy-

cle to the marketing organization, and just as the purchaser attempts to develop a strategy for procurement, the marketing firm is discussing techniques for selling its products.

Low-cost software system sales (defined as costing less than "a few thousand dollars") may only require a few telephone calls, mailing a brochure and user documentation and delivering the source programs and documentation. However, the purchase of more expensive or complex systems usually in-

volves many vendors and a period of several months, Lowenstein noted.

He recommended that all vendor contact be avoided until a general requirements statement has been drafted. Once this statement has been formulated, the next logical step is to bring in vendor representatives.

Keep in mind that vendor sales personnel can actually be "very helpful in determining whether they should be involved" any further in the acquisition process, Lowenstein said. The vendor who cannot satisfy the purchaser's requirements will often remove himself from marketing competition and will sometimes steer the purchasing organization toward an alternative of which it was previously unaware during this elimination process.

Qualify Market

A vendor must qualify its market, Lowenstein noted. Thus, when a salesman asks to speak to someone at a high organizational level, it is not necessarily an indication that he is going over the head of the firm's technical representative. The salesman often wants to be sure that there is a reasonable probability that his efforts will result in a sale, he said.

However, unethical salesmen have been known to discredit the legitimate efforts of a software selection team by attempting to have requirements statements conform to the capabilities of a package, Lowenstein warned. Although a technical evaluation committee has a "limited defense" against such tactics, the most effective tool is open communication with upper management. If the upper-level managers have faith in the qualifications, expertise and preparation of selection committee members, the managers will be inclined to support the technical staff.

The customer should also realize that the salesman's role is "not strictly that of a manipulative strategist." He must not only communicate the properties of his package to the purchaser, but also try to determine the user organization's needs so that he can be of more assistance, the reporter noted. The purchaser who withholds information from a salesman may be doing his company a disservice.

Get Contract Copies Early, Buyers Told

PENNSAUKEN, N.J. — Obtain a copy of all competitive vendors' contracts early in the software package selection process, Albert C. Lowenstein advised in a report on "Software Package Selection and Acquisition" for Auerbach Publishers, Inc. (see related story on this page).

This allows time for the contracts to be passed to the corporate legal staff who can determine whether the contracts are acceptable, he noted. Any problems should be mentioned to the software sales representative as early as possible to avoid coming to an impasse after the purchaser and/or the investor has invested an extensive amount of time and effort, he said.

If enhancements to the vendor's package are anticipated for a particular user, the vendor's willingness to provide these enhancements should be determined and these statements of willingness should be in writing whenever possible. Many formal contracts explicitly disavow verbal statements made by marketing representatives, Lowenstein pointed out.

The contract should also state that the package will work in accordance with the system documentation provided by the vendor, according to the report. This includes not only formal user documentation and programming documentation but also any proposal submitted by the vendor in response to

the formal request for proposal (RFP) previously issued by the customer. The fact that the vendor will be bound contractually by the terms of any proposal submitted in response to an RFP should be firmly established early in the software procurement process, the report noted.

Price Negotiation

Even when existing software and services are inflexibly priced — as is sometimes the case with larger vendors such as IBM — certain aspects of the purchase such as system modifications are subject to "significant negotiation," according to Lowenstein.

Unless an enhancement is so highly specialized that the vendor cannot reasonably expect to market it to other organizations, any enhancement provided for one purchaser will benefit the vendor's marketing effort and vendors can "usually be persuaded to perform system enhancements for a nominal sum," he claimed.

Since there is little room for negotiation once a particular vendor's package has been selected, contractual negotiations should be conducted early in the selection process, he said.

The organization must understand its requirements for information and must be prepared to evaluate and analyze information when it is received in order to deal effectively with the soft-

ware sales representative, he noted. The procurement cycle can proceed in a cost-effective manner within a reasonable time period if this is done.

The simple fact that a software procurement effort has been initiated does not necessarily result in a software purchase, he said. The prospective customer may find that existing software packages are unsuitable to its needs, prohibitively expensive or inferior to software that can be developed in house.

Assuming that the cycle has proceeded to the point where it is determined that the intended system is feasible, procurement is comprised of the following steps: preliminary requirements analysis, identification of candidate vendors, initial vendor contacts, detailed studies of competitive packages, contract negotiations, formal requirements statement (RFP), identification of system modification requirements, features analysis, selection decision and installation, trial use and acceptance.

Contact with the vendor does not usually stop when the package has been installed, Lowenstein said. The vendor's responsibility for maintenance, enhancement, training, documentation and continued technical liaison will vary depending on the type of package purchased. However, if the vendor is responsible for software maintenance, a specific person or group in the client organization should be designated as primary vendor liaison, he said.

1980s: Decade for Prudence

(Continued from SR/5)

all of its current data base modifications to a disk file and a transaction log, typically a magnetic tape. If processing is interrupted, the data base administrator "rolls back" the data base to that checkpoint. This roll-back procedure restores the data to its pre-updated values and to a point in time when the data was valid.

In order for this to work, the application program must include logic to sense that a checkpoint is being taken and to keep track of its position in the input files when the DBMS took the checkpoint. When the application system is restarted after the data base has been restored, it can continue processing with the next logical record.

The problem is that an application

program that was converted from standard file processing to a DBMS may have no recovery logic other than to start over in the event of a system failure.

These considerations do not mean that purchased software should not be used with a DBMS or that all purchased software is converted inefficiently from a master file to a DBMS environment. The trend is toward purchased software and that movement will continue. But the prudent application software purchaser should study how the product functions as well as what it can do.

Wright is a free lance consultant based in Sunnyvale, Calif. who specializes in working with data base management systems.

APL

MAINFRAME PERFORMANCE AT MINIPRICES

- Complete APL System runs on Texas Instruments 990 minicomputers
- VERY efficient APL processor
- Keyed and shared files
- Access to external files and devices
- Configurations for up to 40 users
- Reliable and supported system for production environments by experienced APL Implementers from Myriade and University Laval
- Advanced design by experienced APL Implementers from Myriade and University Laval


MYRIADE
 DATA SYSTEMS LTD.
 3652 CHEMIN ST-LAURENT STE Foy
 CANADA G1W 1Z9
 TEL: (418) 658-1275

You want to give our system a try?
 It's at your door through telecom-
 munications networks.

SPECIAL REPORT

Page 7

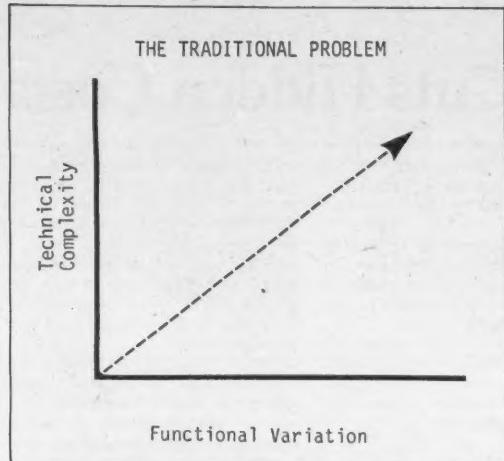


Figure 1. Using the traditional approach to system design causes technical complexity to increase at a rate proportionate to the degree of functional variation.

Manufacturing software packages can function in either a trouble-generating or peace-making capacity between DP and manufacturing user areas, according to an article in Inventories and Production magazine. Butts feels that the traditional approach to application software packages leads to problems. After outlining some difficulties inherent in this traditional approach, he describes the principles of a new methodology for manufacturing-oriented software.

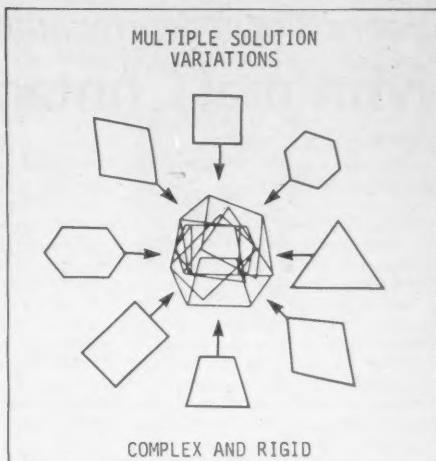


Figure 2. Traditional "multiple solution" packages have tended to be complex and hard to properly document. Such packages are resistant to change.

Package Design Must Provide for Flexibility

By James T. Butts

Special to CW

CINCINNATI — Application software products exist in order to support the operational needs of business and industry. Every application system is a set of programs designed to support these functional needs through the use of specific DP procedures.

DP solutions provided by an application product can vary in a multitude of ways depending on the particular approach taken by the designer. The two primary dimensions of this variation are:

- The functional capability of the application software product.
- The complexity of the system as a data processing entity.

These two dimensions nearly always relate in direct proportion. The more completely the system attempts to satisfy broad ranges and types of needs, the more complex the data processing procedures become (see Figure 1). This increased complexity increases the cost of constructing and maintaining such a system. It is quite probable that this cost will be recovered in the form of a higher purchase price.

In addition to the higher cost associated with the development of a more complex system, the system tends to become more rigid in its structure. This rigidity makes the system less able to accommodate the variations that are present in the initial detailed definition of the same category of system's need within different companies. It also makes the system less responsive to the changing needs of any given company over time because a complex system is more resistant to modification and extension.

Some creators of application systems have tried to resolve this rigidity problem by introducing even more DP complexity into application software products. In order to provide the ultimate solution for a broad variety of prospective users, systems have been designed to appear capable of being configured in a multitude of ways. This has resulted in even higher development costs, higher selling prices, more complexity and less real potential for success (see Figure 2).

The multiconfiguration product rarely provides the optimum solution to the specific and unique functional needs of an individual company. At best, only one configuration is a close approximation of the actual solution to the user's problem. Therefore, the remainder of the multiple configurations are of no use and a portion of the purchase price that has been paid for the complete product is effectively thrown away.

Furthermore, this close approximation is not the ultimate solution required by the user. The product must be further modified, or expanded, in order to completely satisfy all operational requirements. The end result is often a complex system that had initially cost an unnecessary amount and will continue to cost more than necessary to modify and support as time goes on.

Better Approach

A compromise is needed between functional complexity and DP complexity. Providing multiple versions of finite solutions to a problem and suffering the attendant extraordinarily high level of DP complexities is unnecessary.

The use of tested and field-proven approaches to correctly solving the basic functional system needs of most manufacturing companies is a desired improvement in systems development techniques. Designing and documenting basic yet functionally complete solutions and packaging them to accommodate subsequent user tuning and modification is highly desirable. DP and manufacturing control technologies are now available to make such design criteria feasible.

The portions of an application solution that may be considered basic and somewhat common among companies are:

- *Data file requirements.* Although field formats and length may vary, the basic data categories, contents and relationships remain the same.
- *Transactional and report data.* Formats may again vary from one company to another, but transaction types and report contents remain consistent.

tently common.

- *General processing logic.* Specific processing logic may vary among companies in order to support individual requirements; major processing logic, however, is consistent because the data base, transaction types and content, and output requirements are common.

- *Basic controls.* Principles and techniques necessary to perform the primary functions of master production scheduling, material requirements planning and shop floor control have been identified, field-proven and documented.

In addressing these common areas, recent developments in DP can be employed. They reduce the overall complexity of the system and provide greater flexibility for specifically answering the needs of the user. They include:

- *Standard ANS Cobol.* As an application programming language, it is the most accepted in the industry and provides the greatest degree of hardware independence.

- *Structured programming techniques.* These disciplines ensure well-documented, consistent and logical code, ensuring ease of program maintenance and modification.

- *Data base management systems.*

These reduce data and file manipulation problems, provide flexible data relationship capabilities and provide a high degree of hardware and operating system independence.

Basic Considerations

Because change is a certainty of manufacturing, a new approach to manufacturing application software development is needed to address the continual evolution in manufacturing control systems and objectives. Essentially, the needed approach must consider:

- A thorough working knowledge on the part of the systems designer of the basic principles and techniques relevant to effective manufacturing control, with a keen understanding of the interrelationship of the various techniques and subsystems.

- Provision of functionally complete systems capable of being used as delivered or of being easily tuned by the user to suit unique requirements.

- Independence from computer hardware, operating systems and specific manufacturing technologies.

- Thorough and easily used documentation for both technical and non-technical personnel.

(Continued on SR/8)

**SUPERIOR
SOFTWARE, INC.**

SERIES/1

FINANCIAL CONTROLS SYSTEMS

- GENERAL LEDGER
- ACCOUNTS PAYABLE
- PAYROLL
- JOB COST
- PURCHASE ORDER
- ACCOUNTS RECEIVABLE/INVOICING
- ORDER ENTRY
- INVENTORY MANAGEMENT
- FIXED ASSET ACCOUNTING
- SALES ANALYSIS

EDX-COBOL
3101 SUPPORT & COMMUNICATIONS

(800) 828-9106
(716) 664-3843

111 WEST SECOND ST.
JAMESTOWN, N.Y. 14701

SPECIAL REPORT

Page 8

Saves Time, Aggravation, Dollars

Minimal Contact Marketing Cuts Hidden Costs

ENCINO, Calif. — While the costs of the software supplier are built into the product price, there is also a "hidden cost" in customer time taken up by more traditional marketing approaches, according to Stephen Hicks, vice-president of marketing for Dylkor Software Systems.

Out of the effort to cut down these areas of hidden costs, Hicks recommended that the potential purchaser consider the following points when shopping for software packages:

- Does the vendor aid in the evaluation process by providing any basis for

comparison with similar products?

- Are references from current product users readily accessible?
- Does the software house allow for testing the package prior to purchase? Hicks maintained that the seller should make the software available for some sort of "free trial period."
- Review whether the product is installed by the end user or by vendor representatives. If specialized installation techniques and support personnel are required, satisfy yourself that the product is not overly difficult to handle in your environment.
- Keep in mind that while the presence of a large support staff from the vendor may be a positive factor, it can also mean that the system is problem-prone.
- Maintenance agreements should be subjected to careful scrutiny since, for example, some agreements require a special provision for automatic receipt of software update releases.
- Determine if the training tools offered by the vendor — regional seminars, audio cassettes or workbook programs, special sessions — meet the needs of your personnel.
- Are extensive modifications necessary to make the software package meet your requirements? If so, it may be prudent to shop further for applications software that is a closer match to your environment.
- Determine if the product has been installed by other users in your geographical area. If so, there will be a pool of personnel with previous product experience.
- Is the lease price of the packages structured at a level that makes it more sensible to buy the software? If so, consider whether owning the product will be of long-term benefit to your organization.

Model 204 DBMS. You're 'remiss' if you don't check it out.

Here's what the leading software rating service says: "Anyone interested in installing a flexible, user-oriented DBMS would be remiss if they did not evaluate Model 204."

They're right. It will pay you to check out Model 204. Because you'll find that Model 204 is so easy to use that you won't need large teams of programmers for

bringing up new applications. And you'll get the job done quickly. Which means big post savings.

And it will pay you to evaluate Model 204 performance. Because you'll discover that Model 204 performs — and keeps performing, even if your database gets up into the billions of bytes and your terminals get into the hundreds.

Which means no system changes, no reprogramming. Which means big cost savings.

Don't be "remiss." Get further information by clipping your card to this ad and mailing it to us at 675 Massachusetts Avenue, Cambridge, MA 02139. Or call 617-491-7400.

Model 204

Computer Corporation of America

Cambridge, New York, Houston, San Francisco, Chicago, Washington / International affiliates: Tokyo, Berne, Milan, Toronto

Package Design Needs Flexibility

(Continued from SR/7)

- State-of-the-art programming, system construction and data management techniques.
- Simplicity in all regards so that people will understand, accept and use the system.

A prime benefit derived from the successful use of this conceptual approach is an improved working relationship between DP and manufacturing departments. The company no longer must depend on the software vendor, hardware vendor or consultants to accommodate changing and evolving system user needs.

Properly designed and documented software packages are company-manageable entities. This tends to assure both DP and manufacturing that evolving user needs can be accommodated in a much more acceptable time frame with a minimum of software conversion, development and interface work.

Software packages are viewed more and more by both areas as a solution to the problems created by rigid, functionally inadequate in-house systems. However, software packages that are not designed to allow user flexibility in the ever-changing manufacturing environment will not be successful. Software packages must have an architecture that allows the staff to respond in an expedient manner to valid requests for change from the manufacturing system user community.

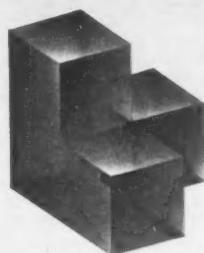
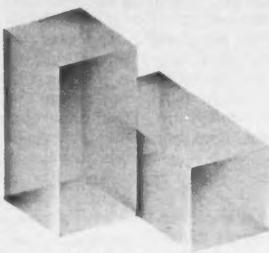
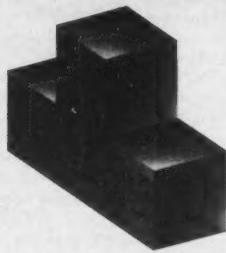
Typically, the rigid, complex nature of traditional application software packages in combination with generally poor documentation causes slow DP response to user problems and requests. Such slow response is usually interpreted as "lack of response" by the system users, and thus we have the traditional barriers formed between system custodians, developers and users.

Correctly addressing such software package architecture and documentation will accommodate a short initial implementation cycle and will tend to ensure that the system can evolve and survive as manufacturing system needs change.

Butts is a senior manufacturing industry consultant for Cincom Systems, Inc.

Multiple Systems Users

MVS/VSI/SVS/MVT/MFT



Multiple Systems Manager

UNIFIED DEVICE MANAGEMENT

The Multiple Systems Manager manages the allocation of TAPE and MOUNTABLE DISK devices across all systems in your complex. It allows you to operate normally with all devices ONLINE to all systems. MSM insures that device allocation by jobs in different systems occurs just as if all jobs were operating in one single unified system.

MSM eliminates the operational burden of juggling TAPE and DISK units among systems. It protects against the danger of a system accidentally rewinding or overwriting a TAPE in use on another system; this removes the single greatest cause of shared tape mishaps.

MSM will use your TAPEs and DISKS more efficiently—which can result in immediate device cutbacks or (more likely) postponement of future acquisitions.

MSM is so transparent that it can be operated without the use of any new operational commands. Of course, there are powerful new commands available—however these are extras, not necessities.

Only MSM allows such truly NATURAL and transparent shared device management.

Other features (for MVS environments only): The MSM Device Preferring capability allows devices to be dynamically structured into a hierarchy of sets; MSM insures that units in preferred sets are used, wherever possible, before less preferred sets.

The MSM SOFTSWAP™ feature insures that DDR device SWAPS for TAPE units will NOT impact JOBS or TSO users which are not using tape allocation. Without SOFTSWAP™, TAPE DDR SWAPS are likely to impede all allocations in a system—including even those which do not use tape.

TSSI

TRANSPARENT SINGLE SYSTEM IMAGE

Allen Services' line of software packages for Multiple System environments, allows an entire complex of systems to be treated almost as though it were one single unified system. The complete "unified system" effect is achieved through combined use of three independent (but related) program products. Each of these, Super-MSI, MSM and GCD addresses distinct concerns present in multi-system environments.

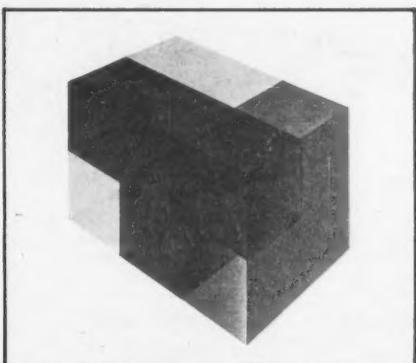
Of course, since the products are independent, if you aren't yet ready for the full-blown unified system effect, you only need to select the products which interest you.

UNIFIED OPERATOR CONSOLES

The Global Console Director is an extremely flexible tool. It allows (selected) message streams from different systems to be logically "blended" to create a unified system image (to whatever degree desired). In a slightly different vein, GCD allows any console on any system to be logically attached concurrently (and perhaps in different ways) to any set of systems in your complex! GCD allows commands entered from any console to be directed and processed anywhere in the complex; in this respect, all consoles are effectively linked to all systems. In almost every aspect, GCD is philosophically and operationally compatible with the standard system console support.

GCD can improve overall throughput by simplifying operations. By allowing several physical consoles to be logically merged, excess devices can be eliminated for immediate savings, or deployed elsewhere to strategic advantage.

GCD is absolutely transparent to your users, and aside from major simplifications, nearly transparent to operations.



ALLEN SERVICES
• CORPORATION

Toll-free: 800-543-7583 x126
Select Dial
Collect: (513-890-1200) (x126)
(513-774-3077)



UNIFIED DATA INTEGRITY

The Multiple Systems Integrity Facility provides the same thorough dataset integrity protection for jobs in different systems that would exist if the jobs were in the same system. In addition to propagating "standard" dataset integrity across systems, Super-MSI also insures that the VSAM "internal" SHR options are honored throughout your entire complex. Effective cross-system VSAM integrity can be obtained in no other way than through the use of Super-MSI.

Another feature: Super-MSI also eliminates the hardware RESERVE lockouts which are normally inherent with SHARED DASD in multiple system environments.

Much more besides: Super-MSI has many other exciting features including special aids for operators and TSO Users. All in all, Super-MSI will be a very powerful addition to your installation.

If you wish to use more than one of the above products, they can be integrated together into a single control task (thus further reducing overhead complexity). In nearly every instance where our products have been competitively evaluated against all possible hardware or software alternatives—our software has been chosen. Aside from IBM, Allen Services has been providing commercial software specifically designed for multiple system environments longer than any other company. Over 500 major installations throughout the world have already selected our products as the preferable means of handling problems associated with multiple system environments. The number grows daily. Reliability has always been an integral part of our design.

When considering software, most people consider support to be a very important factor—Allen Services has over 200 support personnel.

The only other comprehensive approach to unifying multiple systems is JES3 (or ASP). Aside from the fact that MSI/MSM/GCD can be installed and implemented in only a few minutes, there are several other significant differences from JES3: For example, MSI/MSM/GCD (combined) use only 1% to 2% overhead; MSI/MSM/GCD are invisible to your users; MSI/MSM/GCD were designed to be strictly compatible with OS/VS/MVS philosophies—in this regard none of your personnel will require re-training. The majority of all eligible multiple system installations are now using our products to help manage their systems.

SPECIAL REPORT

Five-Year Advances in Manufacturing Sighted

WEST HARTFORD, Conn. — "Two-thirds of all small to medium-sized manufacturing companies in the U.S. will be automated within the next five years," Arthur Martin, president of Computer Covenant Corp., recently predicted.

Martin addressed members of the Connecticut Accounting Profession here during a seminar series entitled "Advising the Small Businessman on Automation."

He maintained that "packaged systems and programming aids are a good solution to the growth of the [manufacturing] industry and the need for more advanced applications." The ex-

pense and scarcity of trained programmers and the "high risks associated with new program development" were the factors that led manufacturing companies to purchase applications packages to meet current and future information requirements, according to Martin.

"Packaged solutions are designed to handle the majority of the user's requirements," he noted while conceding that "a packaged program cannot possibly meet all of the requirements of every customer."

"The intention [of the software vendor] is to provide a base from which the eventual system can evolve over

time," he said.

The need for evolving systems of greater sophistication parallels the end user's increasing knowledge about how to use the computer system. The first-time computer user operates at a disadvantage because he is not familiar with the computer's capabilities, but he usually has more flexible requirements, according to Martin. "Often, to a great degree, the first-time user can 'live' with the [unmodified] package."

The more sophisticated user may have more computer-related experience, but he also has "more closely defined requirements," he noted. These requirements often require software

changes to provide different — if not necessarily better — information to the end user, Martin said.

Since a "good computer package is user-defined," the software purchaser should also be provided with tools that allow him to modify his information data base, to query the data base for specific information and to report this data in a meaningful fashion, he pointed out.

This combination allows the computer user to have "the best of both worlds — a package solution to get the system up and running quickly and data base maintenance and reporting aids to ensure [that] the system can be enhanced in the future and its investment maintained," he said.

Specific Procedures

Martin recommended that the small to medium-sized manufacturing firm go through several specific procedures when selecting and installing a software package.

First, the potential purchaser must review the requirements and features offered by the package in order to learn how it works. After this review, the end user should "request modifications only where necessary, keeping in mind that more experience with the package will eliminate many modifications."

Next, the package should be installed in the various user areas with vendor-provided tools such as a data base modifier and/or report writer to handle special needs. "Once the package is running smoothly and users have become more knowledgeable [the firm can] move into more advanced information applications," Martin said.

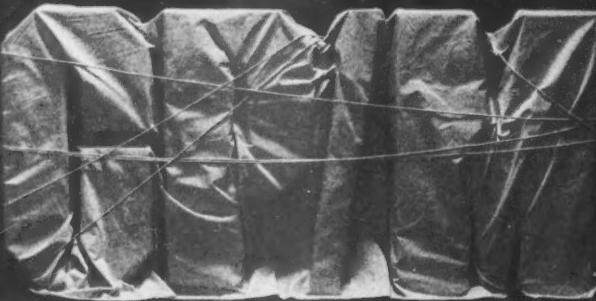
Computer-assisted design and manufacturing (CAD/CAM) systems are examples of these more advanced applications, he noted.

CAD works through allowing the engineer to shape, test and cost a product design that is displayed on a graphics terminal, he explained. Once the engineer is satisfied, the system converts the completed design into machine-oriented instructions for the factory floor and the organization uses the instructions to drive the manufacturing process, he said. Manufacturers who have started with relatively simple administrative functions will soon be performing the advanced modeling and simulation applications now seen in large aerospace and automotive manufacturing companies, he predicted.

"The hardware and software technology is here to do it," Martin said. Now, the challenge is to develop and train knowledgeable workers who can make use of this technology, he said.

Introducing CP/M-86

From Digital Research



The Best Gets Better

CP/M®, the industry standard, continues to expand, because your needs continue to expand.

CP/M-80™

For cost-effective computing on 8-bit Z-80, 8080 and 8085-based microcomputers, CP/M-80 gives you the widest variety of mature, specialized software products anywhere.

CP/M-86™

For jobs that require more address space and increased computing resources, CP/M-86 provides the soft-

ware power you need. CP/M-86 is enhanced to operate with Intel's new 16-bit 8086 and 8088 microprocessors, with all the qualities that have given CP/M industry-wide support.

And there's more to come: MP/M™, our multi-programming monitor, and CP/NET™, our network operating system, and PL/I, now available for 8-bit machines, will soon be available for the 8086/8088 family.

CP/M. It's available on over 250 types of computers. For a closer look, ask your dealer, your manufacturer, or Digital Research.

U.S.A.
DIGITAL RESEARCH
P.O. Box 579
801 Lighthouse Avenue
Pacific Grove, CA 93950
408-649-3896
TWX 910 360 5001

EUROPE
VECTOR INTERNATIONAL
Research Park
B-3030 Leuven
Belgium
32 (16) 20-24-96
Telex 26202 VECTOR

FAR EAST
MICROSOFTWARE ASSOC.
102 Plaza
3-16-14 Minami Aoyama
Minato-ku
Tokyo 107, Japan
03-403-2120
Telex 2426875 MSA

 DIGITAL RESEARCH®



'Chip! This Baby's a Chunk!'

SPECIAL REPORT**Systems Software or Applications Packages?****Hazy Distinctions Cleared for Software Buyer**

By Roy Horsey
Special to CW

HOPEDALE, Mass. — Software packages are classifiable according to such factors as price, function and vendor size, but the line between applications packages and "system software" has become increasingly less discernible. Certainly an inventory software package is generally accepted as an application, but can a data base manager or a polling package for cash registers be considered application software?

A more useful distinction for the application package selection process may be made between software from hardware vendors and third-party-supplied software. The reason for this division is that the software development process is different in the two environments. Although there is sometimes less quality assurance on third-party software, there is greater emphasis on unique problem-solving approaches. And keep in mind that the leverage you have on the vendor is much greater if it is also your hardware supplier.

The prospective purchaser buys software packages because he wishes to accomplish a specific function via the computer system and does not have the resources in terms of personnel, knowledge, training, time and/or equipment to write the software in-house. The wary customer should note that it is not always possible to save money by buying a package rather than developing it — packages can be costly to install.

Vendor Provisions

Elements that should be included in the vendor-provided package include:

- Source Code: Problems generally develop during installation which cannot be cured except by seeing the source code.

- Documentation: Vendors usually make extensive efforts to provide clear, adequate and complete documentation. The reason that the opposite often seems to be the norm may be that the programmers and analysts who actually wrote the software solved the bugs without documenting what happened and how it was fixed.

At any rate, I have not yet seen any documentation which was thorough enough to enable the buyer to install the package without vendor calls and reference to the source code. At a minimum, the documentation should contain a system narrative and system flow chart, a description of data, a description of purpose and use of every file and a program flow chart and source code listing for each module.

- Object code: Although this code may run in your environment, recompiling some programs may be necessary.

- Training and installation support: While this may be included with the more complex packages, a realistic appraisal indicates that the user will have to assume the burden of educating himself about the package if installation is to take place within a reasonable time frame.

The effort to install a package often

depends upon how closely your hardware and operating system fit the system upon which the package was developed. This match can be broken down into three categories:

- Identical hardware and operating system is the best combination. If the peripherals are different or it's a larger or smaller machine within the same model series, or your installation utilizes different features of the same operating system, extensive job control language modifications may be necessary.

- If you have a different machine se-

ries or different operating system that was developed by the same manufacturer

The distinction between systems software and applications software packages is becoming hazy, according to Horsey. But certain steps should be followed by the prospective purchaser of any software package.

turer as that used by the software vendor, the situation can be described as

"fair." One possible source of help in this situation may be the hardware vendor that is common to both installations.

- If both the hardware and the operating system configuration are materially different from those on which the package was developed, chances for successful implementation are usually poor. In the real world, there are many incompatibilities between so-called "Cobol-compatible" systems.

One example of the problems that can arise in this type of situation was

(Continued on SR/12)

Keeping pace with today's competitive business climate is a full-time, demanding job. The last thing your company needs under time-conscious decision-making pressure is a computer program that sometimes creates more problems than it solves.

So, the next time you have a business problem you want your computer to solve, try speaking your own language to it. English. And use a MODEL solution.

MODEL Formulas Equal Business Solutions.

MODEL is a versatile planning and modeling system that lets you use the English language to write applications. And helps your company make decisions fast.

MODEL offers all of the advantages of computer-based technology without requiring technical computer experience. So, anyone from executive management on down can use it to

fit their needs. And all you have to do is let them know MODEL is available.

MODEL Formulas Multiply Your Effectiveness.

Every good executive has decision-making abilities. But the ability to make computer-assisted decisions with speed, precision, and confidence is what makes a MODEL executive. And the advantages outlined in our free brochure will show you how you can multiply your company's effectiveness many times.

MODEL Formulas For Success.

MODEL isn't just a software package, it's a full service commitment. So you don't just wind up with parts of a solution — you get the whole solution.

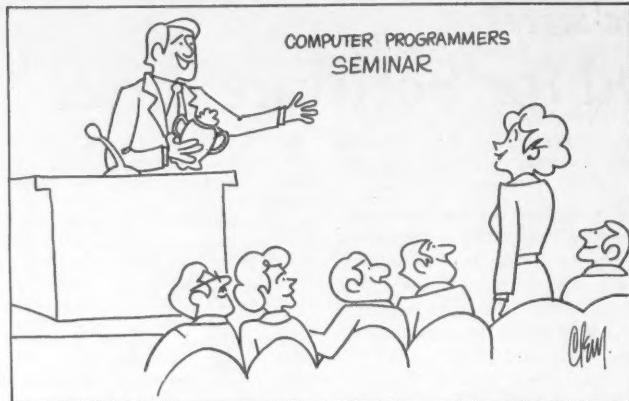
Send today for our brochure, "FORMULAS FOR MODEL EXECUTIVES." And see for yourself how much more effective computer assisted decision-making can be.

FORMULAS FOR MODEL™ EXECUTIVES

Send me "FORMULAS FOR MODEL EXECUTIVES" Now.
Send to: Lloyd Bush & Associates, 1 Battery Park Plaza, New York, NY 10004
Name _____
Company _____
Address _____
City _____
Telephone _____ State _____ Zip _____

USE A MODEL™ SOLUTION.
LLOYD BUSH & ASSOCIATES

SPECIAL REPORT



'And to Ms. Camden, for the Best Acronym of the Month...'

Hazy Distinctions Cleared

(Continued from SR/11)

provided by a DP manager who had to physically move the reflective strip at the beginning of each reel of tape exactly 2.5 in. so that the tapes could be read on another vendor's drives.

Selection Process

Once the decision has been made to purchase an applications software package, certain steps should be followed during the selection process.

First, establish a dollar value on the costs and benefits you expect to derive from the software. If payback will not occur within approximately one year, the purchase may not be worthwhile from a cost/benefit standpoint.

Basic business benefits to look for include an increase in profits or a decrease in costs. Benefits can also be reflected in the potential to handle greater sales or shipping volume, reduce inventory or reduce the float of money or goods.

Second, make a demonstration of the package for the end users who will be working with it on a daily basis. If this is not done, the end user may disclaim any responsibility when confronted by a schedule slippage or installation problem.

A detailed systems analysis of the software is the next step in this process. The purpose of this analysis is to uncover problem areas as soon as possible. There are five possible incompatibilities that may be revealed during the analysis:

- System incompatibilities: The package requires an environment with four disk drives and there are only three drives available or the package required 400K bytes of main memory and you wish to retain multiprogramming on your 512K-byte system.

- Code incompatibilities: The package may have been written with a compiler that allowed indexes to be set to zero and comparisons made between the index and a number that is outside the specified range of an occurring table. If this type of logic does not work under the compiler in your environment, programmers will be required to rewrite all table-handling routines.

- Data incompatibilities: Acceptable data formats can vary from vendor to vendor. For example, packed and unsigned data — a format which is one-half-byte displaced from the more familiar packed signed decimal format — is only acceptable to certain software developers.

- File incompatibilities: Determine if the file-handling capabilities in your system are identical to those assumed by the package. For example, software developed on a minicomputer system that includes just three file-handling instructions in its operating system — CREATE, ASSIGN and DELETE — requires considerable modification for a mainframe system that allows day, week and generation file dating.

- Communication incompatibilities: Factors include buffer sizes, communications protocols, cursor control recognition and appropriate modem and line selection.

Step four involves developing a detailed implementation plan that covers the data requirements, operational schedule and testing methodology.

After selection has taken place, the responsibility for installation should be assigned to one person rather than to a committee. That person will interact with the vendor, end users and technicians in order to keep delays to a minimum.

Implementation progress should be monitored closely with an emphasis on showing some progress on a daily basis. It is recommended that all package features be installed without modification so that the end user can work with them for at least a six-month period. At that point, any features which are deemed unnecessary may be deleted.

Horsey is a free-lance DP consultant who specializes in software package selection and installation.

To work well for Manufacturing, MRP* must also work on the computer.

When searching for an MRP system, many manufacturing firms reason that: "Only functional capability is important, not how MRP works on the computer."

This misconception frequently results in a manufacturing control system that is unable to achieve its functional capability because it cannot be implemented by data processing. Manufacturing therefore never quite gets the system they need, where they need it—"outside" the computer room.

The functional capabilities of your manufacturing system are very important. But, by also ensuring the system works well on the computer, you can be confident it will meet your manufacturing information needs today and adapt to your needs of the future. Then you can truly reap the benefits of MRP—with a lot less time and expense.

Along with "How MRP works on the computer isn't important," there are many other misconceptions that prevent companies from realizing the benefits of MRP.

Misconceptions such as: "Once we've implemented MRP, everything will be all right." Or "Some people might need MRP, but our problem is capacity planning."

At Cincom, we've put together a booklet of the "12 Common Misconceptions about MRP." This booklet will help you get a better grasp of MRP. Then you can come to grips with manufacturing control. We'll be happy to send "Misconceptions" to you. It's useful, and it's free. Write or call: Laura Larsen, Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, Ohio 45211, Telephone (513) 662-2300.



Cincom Systems Inc.
Manufacturing Systems Division

*The Software.
The People. The Solution.*



SPECIAL REPORT

Page 13

*Closer Look at Finances, Accounting***Prop. 13 Pushes Oregon County to Revamp**

ROSEBURG, Ore. — California's passage of Proposition 13 provided the impetus for Douglas County in neighboring Oregon to take a close look at its own financial and accounting systems.

"We were not pleased with the procedures that were being used for payroll, the processing time lag that prevented us from taking discounts when paying bills and the inefficient procedures used for keeping track of our multimillion dollar budget," Bill Vian, chairman of the County Board of Commissioners, recalled.

"Our systems were completely antiquated and we decided that we had to do something about them," he said.

The "something" began with engaging the county's auditing firm, Lipgold, Brenner & Bingenheimer (LB&B) to conduct a detailed review of the existing financial and accounting systems.

Problems Identified

Problems identified within the audit report included the need for a general ledger system, which was resulting in a lack of balance sheet accounting and asset control, the need for accrual basis accounting for the county, and inability to determine the current cash position at any given time and a lack of timely budgetary control over appropriations and expenditures.

In addition, problems in the treasury and cash management functions were resulting in lost investment income, Vian noted. There was no automated accounts payable system and manual journals were used to duplicate work already done in the DP area, he said. Cash receipts were processed manually and a "true receivables" position was "difficult to determine."

"The county's payroll accounting was archaic. The old systems were obsolete, cumbersome and inefficient. There was nothing that could be called a management information system," Jerry Schroeder, project manager for LB&B, noted. "As auditors, we had major concerns for the continued fiscal responsibility of the county in light of growing public and regulatory awareness."

The immediate result of the study was a two-day session involving all of the elected county officials, all county department heads and representatives from LB&B. "That meeting [in May 1979] underscored just how antiquated and unwieldy our systems were," Vian stated.

Objectives Set

Objectives were set to automate the general ledger function, which included financial statements and a standard chart of accounts, to implement expenditure control and encumbrance accounting, to integrate trust and other funds into the accounting process, to establish cost and responsibility accounting procedures and to provide the ability to handle projects and program accounting.

Participants also set an immediate requirement of an on-line accounts payable system to interface to the general ledger system and an on-line accounts

receivable system with receipts registers and receivables management that would interface with the existing billing and accounting systems.

A project team was assigned the task of determining the economic benefits of the project systems and the expected benefits were calculated to be \$1.3 million annually, Vian said.

The same team decided that the financial application software should be acquired from outside vendors rather than developed in-house so that the county's needs could be met in a timely manner.

Five vendors were reviewed in detail and three of these were asked to make formal presentations. The team also visited user sites for two of the vendors, and when the various criteria had been evaluated, financial software from Management Sciences America, Inc. (MSA) was selected.

"Insofar as the selection process went, it is important to note that this was a collective effort that included a number of key users and future users of the systems," Elton Szpaller, manager of DP, pointed out.

"Each person voted individually on a

per-item or per-feature basis. As such, the selection was not a process to simply satisfy DP criteria and expectations nor to engage consultants, but to find the best user-oriented system that would meet most of the users' needs," he said.

Systems flexibility, integration of the human resource and financial information applications and a satisfactory record of support were among the factors that led to MSA's selection, he said.

The potential benefits from the new
(Continued on SR/14)

I bought a Personnel/Payroll Accounting System without first getting a free demo from PDS.

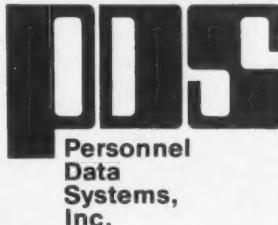


Pray for my soul.

Personnel Data Systems Pass/Accu-Pay does more, costs less, is better maintained, is more effective, is more flexible, and **WE CAN PROVE IT**, on-line or batch, on any hardware configuration.

Let us demonstrate Pass/Accu-Pay to your management team. We run on Burroughs, CDC, DEC, Hewlett Packard, Honeywell, IBM, NCR, Prime and Univac. And we can customize the system to your application, if needed.

The Fine Print: We fully warrantee our system (regardless of hardware type).



WHITEMARSH PLAZA, 15 EAST RIDGE PIKE,
CONSHOHOCKEN, PA. 19428
(215) 828-4294
Call George Sanders for more information

- Let PDS show me the way with more info.
- Have someone call to set up a demo.

Name _____

Address _____

Phone _____

Personnel Data Systems, Inc.
White Marsh Plaza
15 East Ridge Pike
Conshohocken, PA 19428

SPECIAL REPORT

Page 14

Without Right Software, CPUs Just Dead Metal

By Steven D. Bell

Special to CW

REDLANDS, Calif. — The single most important consideration after deciding to acquire a computer is choosing the application software that

will run on the hardware. Without suitable software, even the best computer is just dead metal. Most first-time users, however, are not aware of this fact. The result can be a system that does not perform

to specifications. Ideally, the time to consider application software is before

environment. But the exact fit entails the commitment of more time and money than an

And modifications may be completely impossible with vendor and turnkey packages.

Software costs can come as a surprise to the first-time user. A quality application software package will generally cost from 50% to 100% of the hardware purchase prices, and custom-designed software can be more expensive. These percentages will probably go up as equipment prices fall and personnel costs increase. The availability and cost of continuing software maintenance must also be considered if the user has no in-house DP technical staff.

Professional help in acquiring application software is available to the first-time user from several sources. An experienced programmer/analyst can be hired on a project or on a permanent basis or a DP consultant can be retained. The user should be wary of low-cost "consulting" services from a software vendor which may be little more than a sales lead-in.

Bell is a consultant with Integrated Management Systems, a firm that specializes in small business systems and software.

After making the decision to automate a manual system, you face the equally crucial choice of where to get the software that is right for your installation. Bell points out the advantages of several acquisition alternatives for first-time computer users.

selecting the computer equipment. While hardware vendors extol the virtues of their bells and whistles, the prudent businessperson should realize that the successful implementation of an in-house system depends on the software.

There are several methods of acquiring application software for the first-time user. These include custom development, off-the-shelf software packages and combined hardware and software packages or turnkey systems. Each method offers its own potential benefits and problems.

While custom-designed software is usually more effective in the long run, initial costs can be high. Properly designed and implemented custom software can provide an exact match to the existing business

off-the-shelf version. This is true whether the software is developed in-house or by an outside firm.

Off-the-shelf application packages can be obtained from hardware vendors, turnkey OEMs or independent software houses. These packages can be less expensive initially because development costs are distributed to many users. The packages are usually well tested and eliminate user debugging. In addition, the installation time is often considerably less than that required to implement a custom-designed system.

The main disadvantages of off-the-shelf packages hinge on the lack of flexibility. Relatively inexpensive packages can become costly if the user requires system modifications.

Oregon County Revamps Systems

(Continued from SR/13) systems made it possible to justify a hardware upgrade from an IBM 370/125 Model 0 to a 370/125 Model 2, and disk capacity was increased by 75%, according to a spokesman. In addition a Model 148 was delivered in March 1980 and is running with thirty online terminals in a VM/DOS environment with CICS and DL/1, he said.

System Implementation

Implementation of MSA's general ledger and accounts payable packages was accomplished in approximately 10 months, he noted. The systems were installed by a team of financial users with project management assistance provided by LB&B.

Although the elapsed time exceeded the original county estimate, total manpower requirements were less than anticipated, according to a spokesman.

Since the MSA software was primarily implemented by the users "without significantly impacting my systems and programming department, we were able to devote our efforts to other systems," Szpaller noted.

"For example, we upgraded our assessment and taxation system to on-line and DL/1 status, implemented an on-

line health department immunization system and installed the assessment and taxation system via remote terminals in an adjacent county," he said.

"The tax assessor indicated that he would need fifteen more clerks if he had to go back to a manual system," Sz-

paller said.

Future plans include the installation of MSA's fixed assets accounting system and supplies inventory control and purchasing and accounts receivable packages with on-line capabilities by the fourth quarter of 1981.

The Pascal Software Tool

OMSI PASCAL V1.2™

The value of Pascal in computer software design is becoming widely recognized. And our new V1.2 version contains significant enhancements in ease of operation and reliability. Consider the V1.2 Symbolic Debugger.

Pascal debugging should be performed in Pascal, not with assembler listings and memory maps. Our Debugger knows your data names and structures. Values are accepted and displayed in Pascal notation, including scalars, sets, arrays, records, and pointers.

Complete interactive control displays your original source lines, including embedded comments. Breakpoints give statement numbers and procedure names, rather than octal addresses. The Debugger can show the program execution history, including all stacked procedure calls. Should fatal errors occur, they are intercepted by the Debugger instead of ending your testing.

For more information on our approach, ask for the complete OMSI Pascal V1.2 Product Description.

Oregon Software

2340 S.W. Canyon Road • Portland, Oregon 97201
(503) 226-7780 • TWX 910-464-4779

INTERNATIONAL DISTRIBUTORS

Australia: Sydney
Network Computer Services 211-2322
Canada: Vancouver
Valley Software (604) 291-0651
England: London
Real Time Products 01-588-0667

Japan: Tokyo
Riken Corporation 03-345-1411
West Germany: Aachen
AC Copy 241/50-60-96
West Germany: Munich
PCS D80/88-10-21

**KNIBBS!
WHERE'S MY
DOCUMENTATION!**

Stop falling behind on tedious, tiresome documentation chores.

Introduce your System 34 to the Mann Data Documentation System.

Your documentation will always be current, complete. Automatically.

And program debugging, modification, and development become a lot easier, too.

Next time the boss asks for documentation, ask him for the Mann Data Documentation System.

**The Mann Data Documentation System.
It gets the boss off your back.**

MANNDATA
INC.

50 TOWER ROAD NEWTON UPPER FALLS, MA 02164 (617) 964-3250

SPECIAL REPORT

Keeps Small Bank in Business

Package Justified Despite 3,000-Line Update

VENTURA, Calif. — Despite a "little update" to an applications software package that required some 3,000 lines of new code, program packages are the "way for the small branch bank to stay in business," according to R.T. Shimer, a DP consultant here.

Shimer was called in by a California county bank to evaluate various financial packages designed to handle a certificate of deposit (CD) application.

Although a CD package was currently installed at the bank, he indicated that "it had never been worth the \$300 paid for it" and eventually selected the CD3 applications software from Florida Software Services, Inc. (FSS) to replace it.

Since a similar package had recently been installed for a mortgage loan application, Shimer's team felt that the CD3 installation would be straightforward. This led to the group agreeing to perform a "little update" to the recently released CD3 package.

The result was 3,000 lines of code that affected every program in a system that included more than 100 modules, he said. The new code also required modifications to approximately two-thirds of the record formats within the system, he noted.

Source Code Update

Although the update was accomplished in 10 weeks, it involved matching all source code line numbers manually and recoding all of the source updating procedures, according to Shimer.

The CD3 Cobol modules were set up with Applied Data Research, Inc.'s Librarian package, he explained, while the bank's source library maintenance system was Panvalet from Pansophics Systems, Inc. Differences between the two maintenance packages made the manual updates unavoidable, he said.

After testing and operations documentation were completed, conversion and cutover were assigned to one operator who was able to control the schedule on either a single or a multiple-branch basis, he said.

The package provided the bank with the ability to define several hundred different types of certificates and this allowed the firm to vary interest rates and terms to meet its own requirements, he said.

The contract called for Shimer's group to operate as a service bureau because the bank was too small to support its own computer center, he said.

Code Tailoring

FSS provided a full set of "production-ready" DOS JCL for IBM 3330 disk packs. Since 2314 disk packs were being utilized, both JCL and program source code tailoring became necessary, he pointed out. This type of change becomes fairly complex in a DOS environment with indexed sequential ISAM files, the consultant said.

He also felt that FSS "must have had very few users without floating-point hardware," because the code involved floating-point formulas. Since floating-point hardware was unavailable to the California group, FSS at-

tempted to document the required changes. However, at least one program would not compile because a floating-point formula had been overlooked, he said.

Although Shimer's operating system environment was "a kind of bargain variety MVT," no problems were encountered in the applications package/operating system interface.

While it was difficult to come up with definite figures for a cost/benefit analysis, the consultant felt that his client received "full value" from the FSS package. Initial purchase price

was approximately \$17,000 and annual maintenance cost is between \$2,000 and \$3,000, he said.

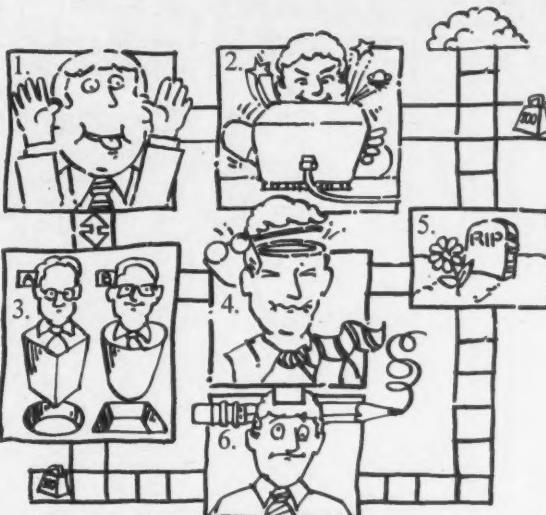
This cost is justified by the "collective security [the software] provides in the face of rising concern over increasing regulation complexity," according to Shimer.

If provided with the opportunity to perform the same type of package evaluation and selection for another client, Shimer described the need for some changes in the relationship between the software development firm and its customers.

First, the programmer/analyst who is to install the product should visit multiple user installations and be invited to attend user meetings, he said. In addition, the small bank end-user must be prepared to accept analytical activities and decision-making from a technical programmer/analyst even when these appear to overlap areas formerly controlled by bank officers.

Finally, it is the software developer's responsibility to encourage a close relationship with the customer's technical specialist, he said.

The Shortcut



The software development business is a tough one . . . Priorities change. Customers change. Programmers change. It seems as if there are just no shortcuts.

As a producer of software, there are only two ways that you can decrease development times. You can either "muscle up", and hire as many programmers as possible (we call this "throwing bodies into the breach"), or, you can take The Shortcut . . . RIMS MPG.

RIMS MPG automatically writes programs . . . and not just simple single file data entry and/or report generation programs either . . . the programs that RIMS MPG creates are complete systems . . . which can make use of multiple files and which include both source code and technical documentation. What's more, the programs that RIMS MPG creates are always in the same, consistent style.

More than 100 organizations have already taken The Shortcut . One of these organizations is Turnkey Systems (of Amarillo, TX) whose president recently wrote us to say that, "we are using RIMS MPG for the development of a complete custom hospital package . . . (and) we have come very close to a ninety per cent reduction in man hours . . ."

More bodies? Or more profits? It's your choice. To learn more about RIMS MPG, call or write us now.

Does This Sound Familiar..?

- 1) Your key programmer quits.
- 2) Instead of coding, your programmer decides to play "Star Trek".
- 3) Programmer "A's" style does not match that of Programmer "B". So programmer "A" decides to re-write everything!
- 4) A last-minute module is needed. Your programmer tells you it will take another ten days!
- 5) Your programmer forgets to back-up his work . . . somebody writes over it! Go back ten squares.
- 6) It's the day of the "big demo" . . . your key programmer informs you of the fact that the job is "90% finished".

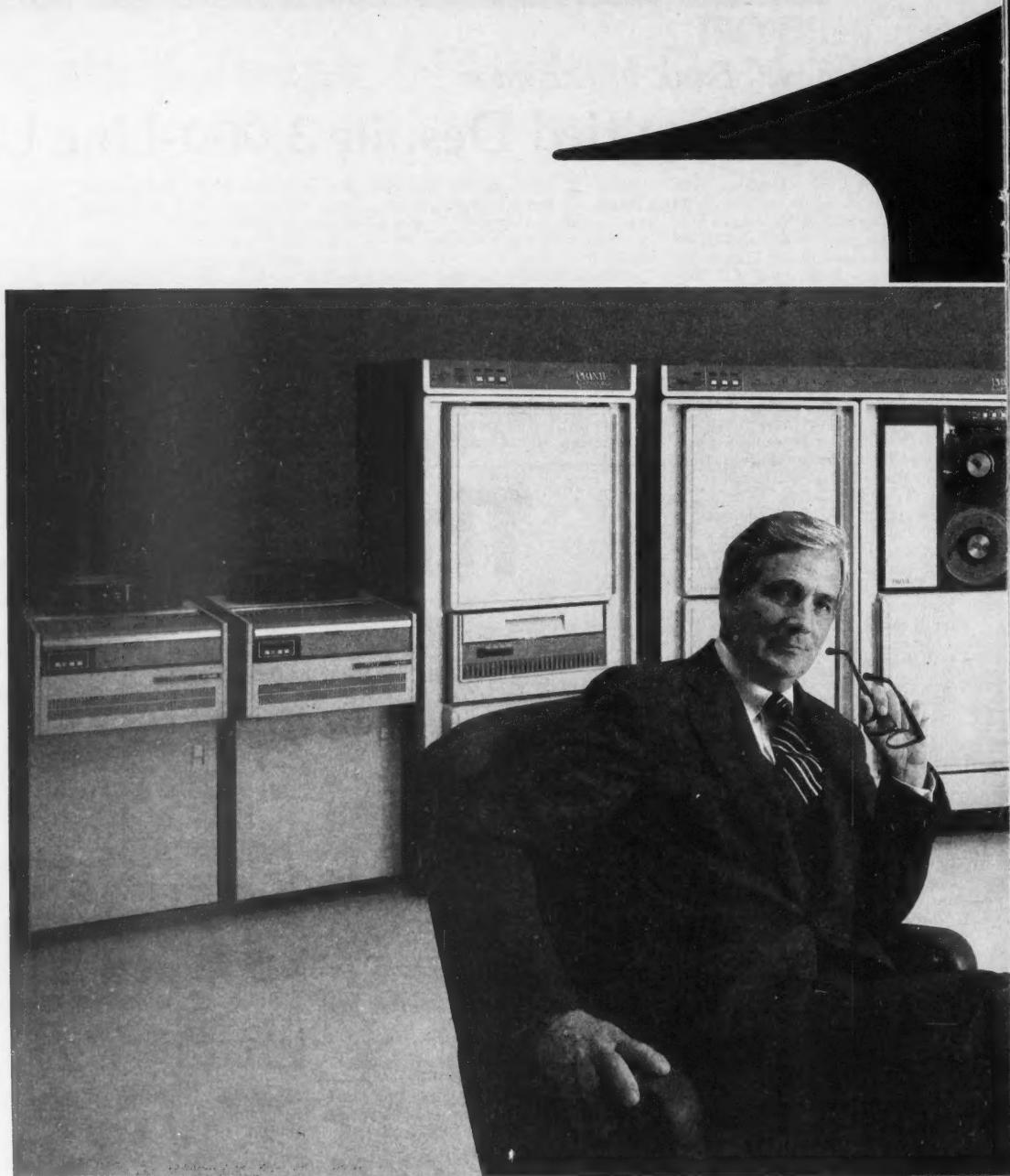


Airport Office Park, Building One
410 Rouser Road, Coraopolis, PA 15108 USA
Phone: 412/262/5507

INFORMATION AND SYSTEMS RESEARCH, INC.

RIMS MPG is currently available for all DEC PDP-11 computers. For a list of other non-DEC CPU's upon which RIMS MPG resides, please call or write.





Meet the first family of compatible computers.

The Prime 50 Series is the first family of 32-bit computers to feature total compatibility. It's a unique feature. And if you intend to grow, it's a capability you won't want to be without.

No growing pains. Compatibility is a word we don't use loosely. It applies across the line to every computer system we make. So no matter what level sys-

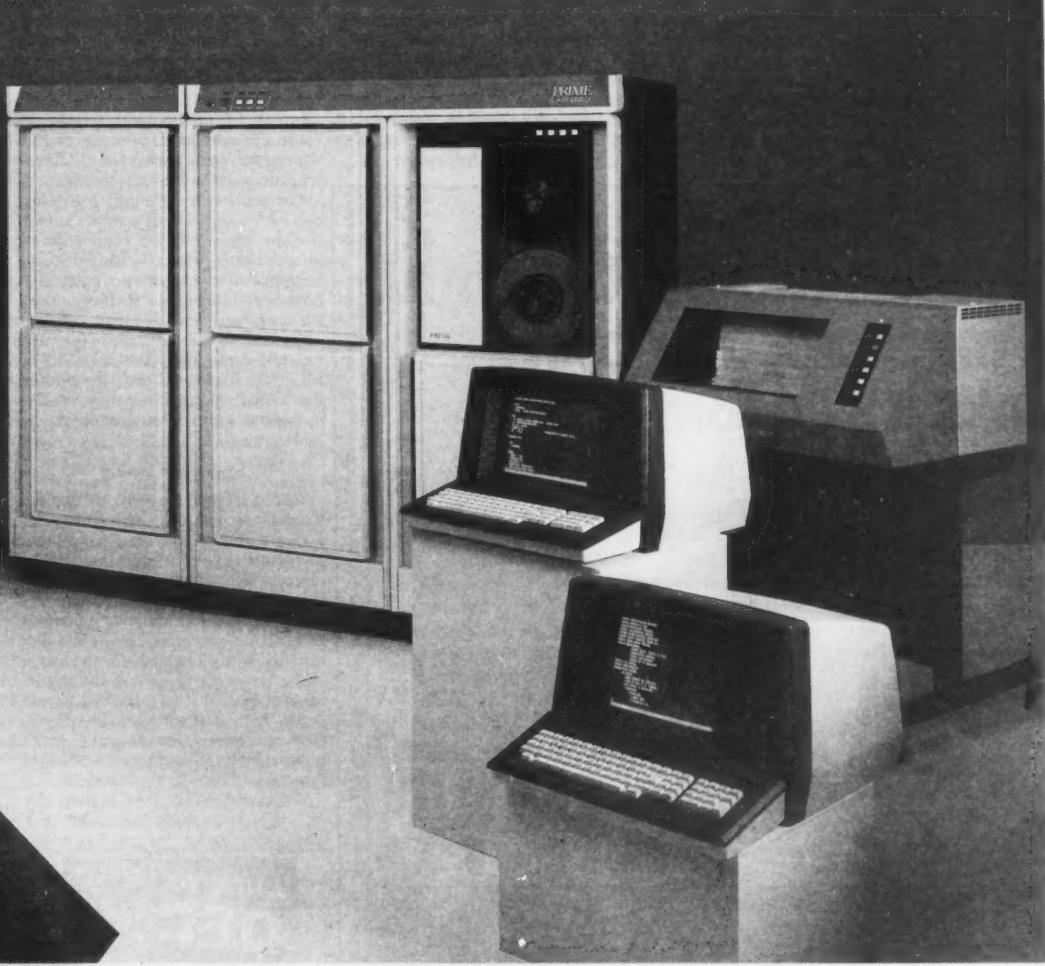
tem you start with, you can easily and economically expand capacity by upgrading your current system or adding another member of the family.

Go big without going with the biggest. Sooner or later, you'll need mainframe capabilities. You may even need them right now. If so, we have good news - you won't have to buy from

a mainframe company. Consider the Prime 750: It has full 32-bit architecture. Sixteen K-byte high-speed cache memory. Up to 8 million bytes of main memory. Thirty-two million bytes of virtual memory per user. And support for up to 2.4 billion bytes of on-line disk storage.

In brief, you can have mainframe capability for less than mainframe cost.

The virtues of compatibility. Thanks to our unique software design philosophy, all Prime com-



puters use the same operating system, the same file structure, and the same communication system, which, incidentally, supports our IBM 3270-compatible Distributed Processing Terminal Executive and the X.25 packet switching protocol.

And all Prime computers run industry-standard COBOL, FORTRAN 66, FORTRAN 77, BASIC, RPG II, PL/I, and Pascal, as well as Prime's CODASYL-compliant DBMS and office automation software.

When you're ready to expand your system, that kind of compatibility can save you a lot of time, trouble, and money.

First and foremost. Prime means first. And we've had a lot of them. We were first with a family of compatible 32-bit computers. First to put mainframe capabilities - like large on-line disk storage and DBMS - on a mini. First with a single operating system and a common file structure across an entire product line. First with large virtual memory on a

mini. And first to open an X.25 transatlantic communications link.

At Prime, being first has become a habit.

Meet the family. In a time when the relationship between price and performance has become vitally important, you should make it a point to meet our family. In the U.S., write to us at Prime Park, MS 15-60, Natick, Massachusetts 01760. In Europe, write Prime Europe, 6 Lampton Road, Hounslow, Middlesex, TW3 1JL, England. Telephone: 01-570-8555.

PRIME
Computer

SPECIAL REPORT

Page 18

Laboratory Software Revives Hospital Revenues,

LYNCHBURG, Va. — Faster and more accurate test reporting, improved laboratory productivity and an estimated \$60,000 annual increase in revenue from recovery of lost charges resulted from installing IBM's Laboratory Data Management System (LDMS) at Virginia Baptist Hospital here.

Automated billing is recovering approximately \$60,000 a year in charges that were lost under the manual system, according to Gene Davis, chief medical technologist. "We've more than offset the cost of the system. By the most conservative estimate, we've saved thousands of dollars more than the system has cost us."

LDMS is also proving cost-effective in terms of improved productivity and better utilization of laboratory personnel.

"Our productivity has increased considerably since we installed LDMS," Davis observed. "Using the work-load recording system of the College of American Pathologists, we've set a target of 55 productive minutes per hour of work. With LDMS, we've gotten as high as 119% of that, better than 60 productive minutes per hour."

The system has also enabled the laboratory to absorb a bigger work load without a corresponding increase in personnel. Since 1976, the year before

LDMS was installed, the laboratory has absorbed a 30% increase in test volume with only three additional employees, a spokesman said.

Growing Work Load

Virginia Baptist's experience with LDMS shows that small and medium-size facilities can benefit from computer-assisted lab systems previously found only in larger hospitals, he said. Laboratory test volume at the 313-bed acute-care hospital has increased an average 20% a year over the past five years, and the laboratory performed more than 730,000 tests during the previous 12 months, he pointed out.

As the test volume grew, so did the clerical work load. Errors inherent in a manual reporting system began to increase, problems with accountability arose and responses to inquiries slowed, he recalled.

LDMS appeared to be a possible solution since it helps manage lab data for all tests performed from the time a patient enters the hospital until the patient is discharged. Test orders and results for major laboratory sections may be entered on-line through CRT terminals, the spokesman said.

Entries for orders and results are made either by menu selection from a display screen or by keyboard. To enter orders on the screen, a terminal operator touches a light pen to desired test names and assigns a status to each test, he explained. On completion of an order entry session, LDMS displays a summary screen listing all tests that have been ordered for final review by the operator.

Speci ally formatted screens for various test types allow the operators to fill in the blanks on each screen, and the laboratory organizes these on-line operations around four terminals, he said.

Systematic Listing

Since a typical patient at Virginia Baptist has about 60 laboratory tests during a hospital stay, it is critical that the results be reported in a readable, reproducible, well-organized format that is meaningful to physicians.

"The [LDMS] cumulative summary gives all the laboratory results in a systematic listing. The name of the test is at the top of the page. All the results for a given test are together, sorted vertically by date and time. The physician can review the patient's entire hospital stay at one glance," Dr. James Piggott, pathologist, explained.

"Under the old manual system, the reports weren't really cumulative. If a

INTRODUCING FORMATION 4000. The minicomputer that thinks it's an IBM 370.

Now you can run IBM 370 software on a minicomputer system—without reprogramming. Formation 4000 is not a plug-compatible processor. It's a low-cost, 32-bit minicomputer system, including a processor, controllers, and peripherals, that runs IBM 370 software.

With the Formation 4000 system, you can offer your customers this vast array of mainframe software at minicomputer prices. The F/4000 accommodates DOS/VSE, OS/VS1, and VM 370 operating systems. You can also extend VM 370 capabilities with Formation's Transaction Management System. This software package simplifies the development of on-line/data base-oriented applications.

Formation 4000 virtually eliminates downtime through an economical redundancy feature. The redundancy design allows any or all

system elements to be duplicated. Each component is fully functional and adds to the capability of the system under normal conditions, but serves as backup equipment when needed.

No need to worry about hardware. Formation installs and supports the total system.

So if you market software, customized computer systems, or data processing services, you can use Formation 4000 to expand your customer base and keep costs down. To find out more, write Formation, 823 East Gate Drive, Mt. Laurel, New Jersey 08054. Or call us at 609-234-5020.



WHEN YOU NEED
DEC...

TERMINALS
• VT-100 • VT-103
• LA34 • LA120
• LA180

PDP 11/03
PDP 11/23
SYSTEMS

LSI/11 MODULES

Demand...Delivery
Demand...Discounts
Demand...UNITRONIX

UNITRONIX
198 Route 206
Somerville, NJ 08876
(201) 874-8500
TELEX 833184

SPECIAL REPORT

Page 19

Recovers \$60,000 Annually From Lost Charges

new result became available, there was no way to put it ahead of the old one that had already been charted. Now all the results for a given test are in one place, rather than being scattered on different pages," he said.

The information contained in the cumulative summary report is updated by interim reports that contain results of all tests completed since the last cumulative report was run, Piggott noted.

An additional reporting advantage of LDMS is faster response to inquiries regarding test results that haven't been charted yet. Instead of the 10 minutes formerly required for laboratory personnel to locate results, on-line inquiry is accomplished in a few seconds, according to a spokesman.

Clerical Burden

The laboratory was running more than 50,000 tests each month prior to LDMS installation in 1977. "We could barely handle the clerical work. Everyone was transcribing and charting. Our error rate was becoming uncomfortable and we had problems with accountability. We couldn't tell who transcribed what or at which point the error occurred," Davis recalled.

"With LDMS, it's possible to inquire at a terminal and learn, in seconds, who ordered a test, who performed the analysis, who entered the result into the computer and which technologist verified the result, as well as the time of each clerical transaction. There's an audit trail that is very helpful," he said.

In addition, it was formerly possible for a test result never to be recorded on a patient's chart, and for laboratory personnel not to know it until it was called to their attention by a physician, he said.

"LDMS handles this problem very effectively," Davis said. "Once you order the test in LDMS, the test is there. If you don't put a result in, the order comes out on an overdue work list."

The software also permits several reviews of test results. "We had an archaic system of reporting our results, manually transcribing them onto the charts. There were too many errors. And the results could never be checked again unless someone questioned them," according to Piggott.

"LDMS allows a review of all the results that have been put into the system," he said. "If results are put in by a clerk, they have to be reviewed and verified by a technologist before they become available. The next day, when the old work lists are published, they can be reviewed by the section supervisors and then by the pathologist. By the end of today, I'll know everything that went into the system yesterday."

The applications package allows laboratory technicians to spend less time on clerical tasks, Robert Mills, director of management services, said. "LDMS has proven cost-effective. It's enabled us to better utilize skilled technicians in their work area. These are valuable people who should be doing lab work rather than shuffling papers or hand-posting reports," he noted.

Since laboratory test results must, by law, be kept for varying lengths of

time, filing and storing patient information can be a prodigious clerical task. "You can do really well alphabetaizing and filing 100 laboratory results and you can do fairly well with 1,000. But when you're dealing with 750,000 test results a year, just filing them is a tremendous task," Davis explained.

However, filing, storage and retrieval of test results is an automatic by-product of daily system usage with LDMS, he said.

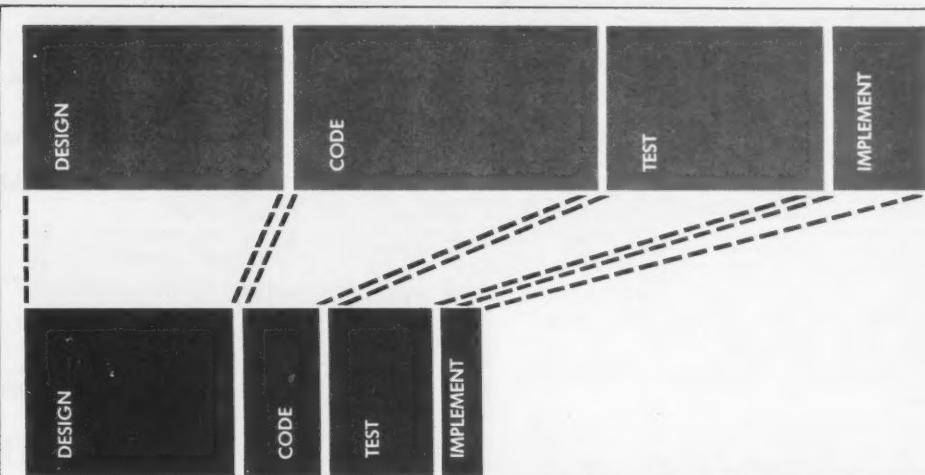
Organizing the daily work load has also been streamlined via LDMS, a spokesman said. Its work organization facilities allow users to plan and monitor all test operations within the lab.

For example, the system accumulates and organizes order entry information to generate both a daily specimen collection schedule with its corresponding specimen labels and nursing station lists of all patients on the collection schedules, he said.

"We know at a glance how much lab work we have," Kay McDonald, lab technologist, explained. "We know what tests will be run before we get the specimens. Before we had LDMS, two people would take the request slips in the morning and write out the work lists. Later, we'd have to shuffle through the work lists for results and

transcribe them to the request slips, which were then taken to the floor and the results transferred to the patient chart.

"One of the biggest advantages of LDMS from my standpoint is that it doesn't take a whole lot of ongoing effort on the part of the DP staff to keep the system running," James Seftor, director of DP, observed. "All the data is entered on-line by the lab personnel, so I didn't have to increase my data entry staff. Our main support effort is with the Batch Reporting portion of the system. The required programming and systems support is minimal," he said.



GENASYS CUTS SYSTEM DEVELOPMENT TIME IN HALF.

Your application systems take longer to develop than they should. And the longer they take, the more they cost. Not just in people resources, but in system effectiveness. Business conditions change constantly. The system that meets original specification may fall short of current need.

Genasys is a proven set of software tools that cuts development time for Cobol- or PL/I-based application systems in half. Genasys can double the productivity of your analysts and programmers by automating detail design, program coding and documentation.

By systematizing your development cycle—generating consistent program structures and producing up-to-date documentation—Genasys cuts program

coding and testing time by 80%. And system maintenance time by 75%.

But most important, Genasys generates a unique Design Manual as a means of maintaining end user involvement throughout the entire development cycle. Genasys helps analysts and users work comfortably and interactively, without language barriers.

If you have one hour to invest in a comprehensive presentation of Genasys, call our Vice President of Marketing at (212) 687-2015, or write:

GENASYS INTERNATIONAL, INC.
17 East 45th Street, New York, N.Y. 10017

SOFTWARE WANTED

Announcing a new market report for software vendors.



The 1981 Software Writer's Market contains:

- 1800 firms who will market your software
- Detailed writeups describing how industry leaders procure and market software from independent vendors
- Service bureaus, mailorder specialists, consulting companies, manufacturers, publishers, 1500 retail computer stores
- The first market report of its kind — an overview of the entire software industry

The new 1981 Software Writer's Market contains more than 1800 firms who market programs for independent software authors. They pay a royalty on sales, many will buy all rights.

The results of extensive research by Kern Publications, each company is given a detailed writeup which explains how they market software from independent software vendors, what kinds of software they want, royalty rates, contract details and most importantly — who to contact — including names, addresses and phone numbers of the key decision makers in each company.

Included are industry leaders such as Wang, Hewlett-Packard, Atari, Apple, MCAUTO, Arthur D. Little, Digital Equipment, Osborne/McGraw-Hill, Data Train, Computerland ...

The firms listed in this market report want software from independent authors and small businesses. If you're in the business now, or would like to be, you will find this directory to be indispensable. It will save you time and money and will open the door to many new and rewarding business opportunities.

Supplies are limited. Reserve your copy now! Phone orders accepted

KERN PUBLICATIONS
190 Duck Hill Road
P.O. Box 1029, Duxbury
Massachusetts, 02332
Phone: (617) 934-0415

Send me _____ copies of the 1981 Software Writer's Market @ \$45 per copy. (Mass. residents add 5% sales tax).

- payment enclosed VISA
 purchase order encl. Master Charge

Name _____

Address _____

City _____ State _____ Zip _____

Card # _____ Exp. Date _____

SPECIAL REPORT

Package's Integrated Design Attracts Boeing Managers

WINNIPEG, Man. — Integration between terminal-oriented processing, application modules and a central data base was a key factor in the selection of NCR Corp.'s Manufacturing Information System Support Integrated On-Line (Mission) System for the Boeing Corp. facility here.

J.D. Martin from DaTech, Ltd. worked with Boeing management to select an appropriate software package for the plant (see story on SR/21).

Mission's design can be envisioned in terms of a circle with three rings of interlocking gears, Martin said. With this integrated design, the turning of any gear in any ring can set all gears in motion, so the system has a strong potential for improving coordination in an organization, he claimed.

The circle's outer ring holds NCR's Tran-Pro and data dictionary software, Martin explained. Designed to simplify terminal communications, the software allows appropriately trained terminal operators to communicate with the system with English commands.

Boeing management can also use Tran-Pro to determine the functions to be performed on each terminal and to assign passwords that permit individual employees to handle selected functions, he noted.

Application Modules

The design circle's second ring contains 11 application modules. These modules feed in information and extract data from the central data base, or core ring, to perform specific tasks, Martin explained.

Since the manufacturing application modules are interactive and often function in unison, he found it difficult to describe individual module functions. However, brief definitions of module functions help in understanding the scope of the software package, he said. These functions include:

- A bill-of-materials system that identifies all assemblies and subassemblies for each manufactured part and notes the interrelationship among parts. The system can keep track of past and future product structures for on-line inquiry and planning purposes as well as current structures.
- A material management system that provides control over physical inventory from the time materials are received until they are consumed in manufacturing or shipped.
- An inventory management system that provides financial inventory control including transaction registers and reporting figures.
- A material requirements planning system that uses bill-of-material product structures to explode production plans. During this process, inventory status in the material management system is examined to determine quantities of items needed and when they are required.
- A routing system that is the labor bill of material; it details how each part or product is built. Like the bill-of-materials module, it serves one or more other modules as a key information

base. For example, the routing system has the essential labor information needed to run the capacity planning system.

- A costing system that provides control and monitoring of product costs by compiling average material and labor costs through bill-of-material and routing systems.

- A work-in-process system that enables the plant to release manufacturing work orders and to track them through to completion.

- An order processing system that tracks customer orders through the plant from entry to shipment.

- A purchasing system that is used to enter and release purchase orders and to analyze vendor and shipper performance.

- A capacity requirements planning system that compares results to capacity after examining projected workload.

- A master production scheduling system that enables the plant to establish a realistic master schedule. It also permits management to generate simulated models that help with strategic planning.

All of these modules result in a closed-loop system, Martin said. All functional areas of the organization are tied into the master production schedule, which becomes the axle around which the machinery of production revolves. Because the system functions in an on-line, real-time mode, up-to-date information is available.

(Continued on SR/22)

SOFTWARE FINANCING AVAILABLE

Funds are available to finance the marketing of new completed program packages.

Write to: William B. Ward

LEASING CONSULTANTS INCORPORATED

15 Furier Street
Totowa, NJ 07512

Automated Systems Design Methodology

PRIDE-ASDM

For the first time, a proven Systems Design Method is implemented through direct use of the computer. With "PRIDE"-ASDM, analysts and designers interact with the computer throughout the entire development process.

"PRIDE"-ASDM can automatically ...

- Perform Computer Aided Design (CAD) for systems development.
- Generate and maintain all systems documentation.
- Provide Information Resource Management (IRM).
- Monitor Business Systems Planning (BSP).
- Perform effective Quality Assurance.

"PRIDE"-ASDM is the next logical step into your future.
Call or write us today.



m. bryce & associates, inc.

1248 springfield pike • cincinnati, ohio • 45215
(513) 761-8400 TWX: 810-461-2691 (M B A WYOG)

"Software for the Finest Computer—the Mind."

WITH OFFICES AROUND THE WORLD



SPECIAL REPORT

For Manufacturing Control

End-User-Developed Tool Put to Work at Boeing

WINNIPEG, Man. — Who would be the logical developers of manufacturing control application software? One good answer might be the end users within the manufacturing departments who must satisfy control and production requirements from multiple plants, according to J.D. Martin, marketing manager for DaTech, Ltd.

DaTech, a DP service and consulting bureau, was called in by Boeing Corp. management to develop a program to improve the Winnipeg facility's communications network.

Boeing management wanted an economical way to cope with its complicated product structure problem and maintain tight control over manufacturing, Martin said. "The plant previously had operated entirely on manual systems, and management knew that replacing these highly intricate and scientific manual methods would not be easy. The timeliness of information rather than its accuracy was the major problem," he noted.

After DaTech researched a variety of software options and system alternatives, it selected NCR Corp.'s Manufacturing Information System Support Integrated On-Line (Mission) system. Since Mission was an on-line, real-time, transaction-oriented system, it provided the timeliness Boeing sought, Martin said. Flexibility and proven performance also weighed favorably in the selection process.

"I don't think I can overemphasize the importance of the fact that Mission was developed over a period of years by managements at several NCR manufacturing facilities to meet their individual and combined needs," he said. "I think the system's flexibility and the ease with which it can be adapted to satisfy different companies' requirements is largely due to its development history. It was designed by manufacturing users to satisfy the requirements of a number of plants."

The 650-employee Boeing plant has the same type of communications and interaction pattern as most manufacturing facilities, according to Martin. Coordination and rapid interchange of information are essential if the plant is to take into account hundreds of factors from changing product bills of materials to capacity limitations to produce sophisticated products efficiently at the lowest possible cost.

New Communications Picture

Now that most modules in Mission have been brought up, the plant's communications/interaction picture resembles a wheel, Martin said. A department or production group at the end of each wheel spoke can input or access information directly from the data base hub of the wheel. If factors in one department change, affected groups know at once. For example, if engineering proposes to change a product's bill of material in six months, the new product configuration automatically is figured into advance purchasing requirements.

One of the major strains on manufacturing facilities is caused by product changes, he said. "And product structures have much shorter life spans as

companies attempt to seize the opportunities presented by new technology and altered market demands. Directly or indirectly, every functional group in a manufacturing organization is impacted by product structure changes."

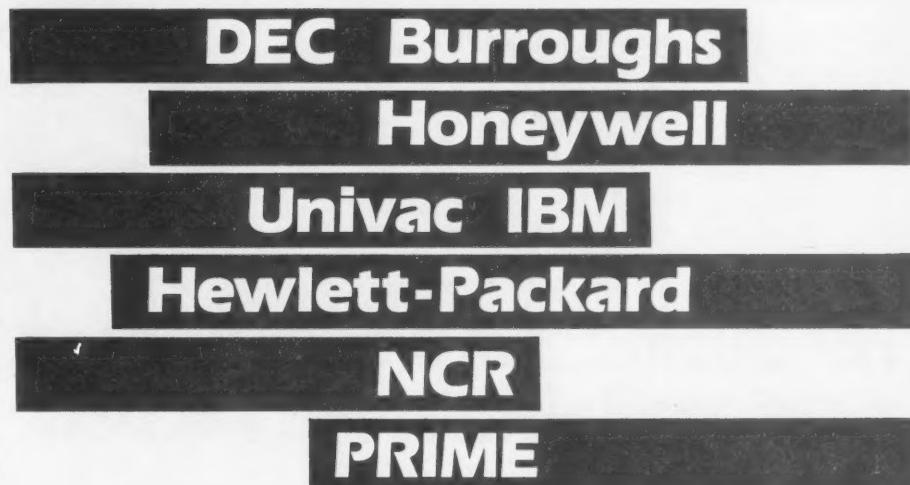
In a static environment, manufacturing can use historical data to project what quantities of raw materials must be ordered now to meet manufacturing requirements in six months. But if old products are replaced by new ones and structural alterations dictate different subassemblies and routings, historical data has little value, Martin noted.

Complex product structures complicate explosion procedures to determine lowest level needs for material requirements and work center planning. As a consequence, an organization that tries to manually feed change information through its network is always working with outmoded plans or inaccurate data, he said.

Boeing constructs some aircraft body assemblies of fiberglass and other high-strength materials. The plant manufactures 4,000 component parts and purchases another 8,000 parts and raw material products, each of which

may be used in a variety of subassemblies. To complicate matters, two-to six-month life spans for product structures are common.

By the end of 1981, between 24 and 30 on-line NCR 796-301 and 796-501 data terminals located throughout the manufacturing facility are expected to link managers to the system. Some eight terminals are currently tied to an NCR 8550 computer located at DaTech headquarters some 10 miles away. The Mission package runs in a 512K-byte partition in a B-3 operating environment, Martin said.



THE CYBORG PAYROLL/PERSONNEL SYSTEM RUNS ON ALL OF THESE.

Not only does the fully supported Cyborg Payroll/Personnel system run on virtually any leading-edge hardware configuration, but it runs smoothly and efficiently.

And it's currently up and running for more than 4,000 organizations and companies with about 4,000,000 employees...at this writing.

This system is capable of performing thousands of functions, which we obviously can't list here. It's becoming increasingly popular

in Canada and the USA.

As a matter of fact, we've recently opened offices in California and Canada to better serve those customers. As the benefits of the system become more and more well known, we'll be expanding into more and more areas.

Get on the line so you can go online, or drop us a note today. Put your payroll/personnel problems in the Cyborg system...and watch your problems turn into results.

Cyborg Systems, Inc.

When it comes to people...people come to Cyborg.®

21st Floor/2 North Riverside Plaza/Chicago, IL 60606/(312) 454-1865/ In Canada 2742 Ross Avenue/Cornwall, Ontario, K6K 1E5/(613) 938-7431/2091 Business Center Drive/Irvine, California 92715/(714) 955-0870

SPECIAL REPORT

Minimal Organizational Impact

General Mills Adapts Ledger Package With Ease

MINNEAPOLIS — Minimal organizational impact, particularly in the programming area, was a General Mills, Inc. requirement when shopping for a general ledger package, according to Rod Dachel, manager of financial systems development for the Consumer Food Group.

The firm settled on the Corporate General Ledger (CGL) package from American Management Systems (AMS) because "of all the software systems we examined, CGL had the least impact organizationally."

"Existing accounting personnel were

trained to operate it and there was no need to use additional computer programmers. We even reduced the accounting staff by one," Dachel said.

The package provided compatibility with the Basic General Mills account code and was easily tailored to handle three additional modifiers the firm utilizes for reporting clarity, he noted.

"In addition, the system is able to define file attributes and utilize internal capabilities of predefined tables," Dachel pointed out. "Minimal input data is validated against the predefined tables and internally expanded

through an internal process." This eliminates the requirement for additional input, saves time and reduces erroneous entries, he said.

The package was adapted to the entire General Mills environment, Dachel continued. "Presently we have 22 systems feeding transactions into the system on an automated basis, including sales, payroll, accounts receivable and production. Installation required no change for these and other feeding systems." Since it is responsive to accounting changes CGL offers the company extensive expansion ca-

pabilities, Dachel added.

Some of this adaptability may be traced to CGL's procedural language, an AMS spokesman said. While packaged accounting systems often include report writers so users can define reports in accounting terminology, AMS opted to include a language that allows the user to specify editing rules in accounting terms.

"To date, we have used the system to process the 1979-1980 fiscal year accounts providing a complete set of historical data used for tracking. Our 1980-1981 fiscal year began in late May and we have successfully processed the June through current business in the system," Dachel said.

CGL is currently being used for the Consumer Food Group, which is the largest business segment of General Mills, as well as by the James Ford Bell Corp. and the Corporate Staff Activities. "We are also using it to consolidate all domestic and foreign entries for General Mills, and future plans provide for the possible addition of some domestic detail ledgers within the system," he continued.

Compatible with distributed processing networks, CGL is available in versions for IBM 370 and Digital Equipment Corp. computers. The firm provides on-site training, conversion consulting, documentation and a user-advised enhancement program with each installation, a spokesman said.



Gary W. Hedge
V.P. Marketing,
MCBA

"These packages represent the cumulative design effort of MCBA's six years of experience in supplying business applications. Based on the fact that MCBA software is currently up and running in over 8,000 user sites, these HP packages promise to please end users and give OEMs and Third Parties the opportunity to make efficient and profitable installations."

HP Business Applications now available from MCBA.

After several months of development, documentation and testing, we are pleased to announce the completion and availability of the first two of our six business applications in HP COBOL II: **Accounts Receivable** and **Order Entry/Billing**.

These long awaited packages are written in ANSI '74 COBOL and are designed for any HP 3000 configuration (including the new Series 44) employing HP's IMAGE data base manager.

Following is the schedule for completion of MCBA's four remaining HP applications:

Package	Approx. Availability Date
General Ledger	1st Quarter, 1981
Payroll	1st Quarter, 1981
Accounts Payable	2nd Quarter, 1981
Sales Analysis	2nd Quarter, 1981

Because MCBA supplies source code and complete documentation, HP OEMs, Third Parties and users will find these applications easily installable and modifiable. Each package has its own data base except O/E which uses an expanded A/R data base. Full use of HP's QUERY facility is made possible. Rather than employ HP's VIEW, we have written a character mode screen I/O sub-routine which allows for interactive data validation on a field-by-field basis. This speeds data entry by interactive access to the data base and allows use of all 262x and 264x terminals.

Contact MCBA's Sales Department for Demonstration versions of these first two packages, complete with data files and user documentation.

MCBA's HP Applications Discount Program

MCBA has re-instituted a program to accept advance payments at substantial discounts for software which is scheduled for release but is not yet shipable.

These discounts range from 5% off for a single-use license up to 30% off on a 50-use license.

For more detailed price, discount and product description information, contact our Sales Department.



HP 3000
Series 33

MCBA® is the registered trademark of Mini-Computer Business Applications, Inc.

MCBA® Mini-Computer Business Applications, Inc.
117 South Brand Boulevard
Glendale, California 91204
Telephone: (213) 247-9050 Telex: 194188

Integration A Key Factor

(Continued from SR/20)
able for the planning process. The system also alerts management to exceptional cases by pinpointing areas in which there are deviations from the plan.

"Users aren't constantly attempting to balance interrelated files or haggling about what version of the truth is accurate. Of course, the data base management approach also makes the system more efficient, since redundant data does not need to be stored in a series of files," he observed.

Mission's modular structure enabled Boeing to implement the system in an organized, logical fashion, Martin said, and disruption to the organization was minimized.

Training manufacturing employees to use the system has proven easy. It takes about two days to teach a novice how to enter data and make inquiries on-line. But because of the system's standardization, the same user can learn to work with additional modules in about a half hour, he said.

Martin indicated that the Boeing implementation began with the establishment of engineering product structure files and the introduction of bill-of-material, inventory management and material requirements planning modules. Now Boeing is addressing the labor side of the equation. It has established variable work center routings for most products. Total implementation of the master production scheduling module will be the last step.

There are 6 key factors for success in database systems. One of them is...

FACILITIES FOR FAST APPLICATION DEVELOPMENT

Data processing management is looking for ways to increase staff productivity. The best way to improve productivity is to provide your staff with the tools to develop applications quickly and easily. IDMS is just such a tool.

IDMS is the most powerful DBMS in the world. It allows applications designers to truly mirror a company's operations within the limits of the company's computer processing capabilities.

However, you also want to develop these applications faster, with fewer people. Simply stated, IDMS has easy-to-use tools for input processing, data management and out-put processing. Traditional programming is greatly reduced via the Application Development System, OnLine Query, CULPRIT Report Generator and the INTERACT on-line program development facility. As a result, IDMS will dramatically reduce the application development cycle. Other DBMS systems reduce system development time too, but IDMS gives you a big bonus—the application will run fast, faster than with any other DBMS. And your maintenance costs will be reduced by 80% compared to in-house developed applications.

Attend a free seminar (with demonstrations of OLQ and INTERACT) on IDMS, the dictionary-driven DBMS which meets the six key factors for success in database systems.



Database
Systems

Free Seminars

Learn about the other 5 key factors for success in database systems. Attend a free management seminar on IDMS and the complete family of software systems from Cullinane.

Dates and Cities

FEBRUARY

- 3 Davenport, IA
- 3 Madison, WI
- 3 Raleigh, NC
- 3 Washington, DC
- 4 Toronto, ONT
- 10 Allentown, PA
- 10 Cleveland, OH
- 10 Roanoke, VA
- 10 Topeka, KS
- 12 Mobile, AL
- 12 Tulsa, OK
- 17 Calgary, ALT
- 17 Denver, CO
- 17 Portland, OR
- 18 Buffalo, NY
- 18 Cincinnati, OH
- 19 Indianapolis, IN
- 19 Phoenix, AZ
- 19 San Antonio, TX
- 19 Stamford, CT

MARCH

- 24 Green Bay, WI
- 24 Pittsburgh, PA
- 25 Orlando, FL
- 26 Albuquerque, NM
- 26 Nashville, TN
- 26 Providence, RI
- 26 Saddlebrook, NJ
- 26 Des Moines, IA
- 3 Lansing, MI
- 3 Winnipeg, MAN
- 4 Westbury, NY
- 5 Honolulu, HUE
- 5 Charlotte, NC
- 10 Minneapolis, MN
- 10 Seattle, WA
- 10 Toledo, OH
- 11 Cincinnati, OH
- 11 Tallahassee, FL
- 12 Newport Beach, CA
- 12 Syracuse, NY

APRIL

- 12 Worcester, MA
- 17 Oklahoma City, OK
- 18 Cleveland, OH
- 18 Fremont, CA
- 19 Springfield, IL
- 19 Edmonton, ALT
- 19 Manchester, NH
- 19 New Orleans, LA
- 19 Norfolk, VA
- 24 Baltimore, MD
- 24 Salt Lake City, UT
- 24 Springfield, MO
- 25 Indianapolis, IN
- 26 Albany, NY
- 26 Boston, MA
- 26 Southfield, MI
- 26 White Plains, NY
- 31 Greenville, SC
- 31 Valley Forge, PA

<input type="checkbox"/> I'd like to attend your seminar on _____	Date _____
In _____	City _____
<input type="checkbox"/> I can't attend a seminar, but please send me your brochure IDMS, the Dictionary-Driven DBMS That Meets the Six Key Factors for Success in Database Systems.	
Name/Title _____	
Name/Title _____	
Company/Department _____	
Address _____	
City _____	
State _____	Zip _____
Phone () _____	
My computer is _____	
Mail to: Rosalie Cope, Cullinane Database Systems, Inc. 400 Blue Hill Drive, Westwood, MA 02090 Phone (617) 329-7700	

Database: Cullinane

SPECIAL REPORT

CPA Firm Finds Tailored Software Best Option

HOLLYWOOD, Fla. — What does a certified public accounting (CPA) firm look for when selecting accounting software packages? "A software vendor that understands the theory of accounting," according to Leroy Koross, a partner in Pollak, Zoller, Koross and Reiss (PZK&R) here.

The firm had used a service bureau for some 14 years, but "we were limited in the services we could provide our clients and outgrew the usefulness of our service bureau," Koross stated. "We had reached that point when other firms had caught up with us in the processing services they offered their clients. In order to stay ahead

competitively, we needed to provide our clients with additional services and provide a better turnaround.

"When we found that we were paying the service bureau more than the cost of an in-house computer, we decided to see what was available in the marketplace," he said.

After a one-year study of computer manufacturers and software vendors offering products for accounting firms, he selected an IBM System/34 with software from Atlanta-based Management Control Systems, Inc. (MCS). "Since MCS was started by accountants, their thinking was the same as mine," he said.

For example, the programs were designed for accountants rather than being available to accountants as well as manufacturers, contractors and others. "The packages allow us to provide services such as financial statement preparation, payroll checkwriting, accounts receivable, loan amortization, depreciation schedules and 1040 tax returns to our client base," Koross said.

"We use the MCS practice management and due date monitoring systems to assist us in managing our firm. These programs were designed according to the workflow of accounting firms and enable us to maximize the

productivity of the PZK&R staff," he continued. "Our software fills the specialized needs of a profession where services are so calculation-intensive that DP is a natural."

The company's cash flow improved immediately after package installation. Collections doubled during the first month of computerized billing, according to Koross.

Aged accounts receivable information is printed at the bottom of each statement. "I had clients call and apologize that they were in the 90-day column," Koross said.

Prior to computerization, the company sent out bills each month and clients didn't know where they were, he explained. So, they didn't treat the firm as a "regular" vendor.

The work-in-progress balance has also been reduced because all time and charges are billed monthly, Koross noted.

Fast Turnaround

Processing time with the MCS Financial Reporting System reduced turnaround time from four or five days to 24 hours, Koross said.

"Besides using the computer to bill our clients every month, we provide accounts receivable services [to them]," he said. A typical client for this service would be a doctor who cannot cost-justify an in-house computer and wants accounts receivable billed at the end of every month.

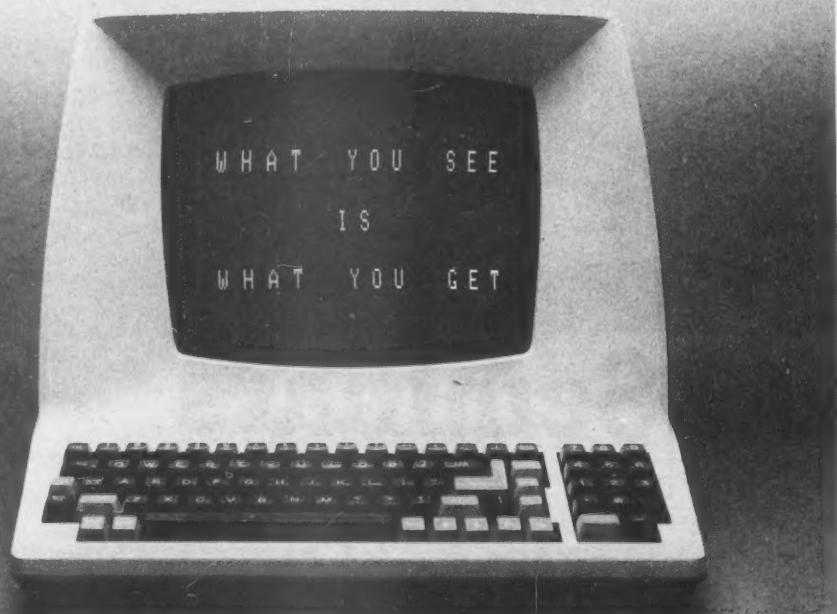
Koross indicated that training was the key to successful conversion and implementation. "You must commit your firm to education. Once you've got the system, make sure everybody knows how to use it," he said.

Conversion to the new system was accomplished in approximately six weeks — and that was during the middle of tax season, Koross said. Monthly clients were automated first, then quarterly clients as time permitted. All of PZK&R's regular clients were on the system by April 30.

The key to avoiding the expense of an in-house programmer was software vendor support, Koross noted, adding that the response time for getting answers to software questions is sometimes as rapid as a few minutes, depending on problem complexity.

And "we have had very few problems with the System/34. Response time from IBM is usually less than an hour," he estimated.

Can your word processor pass this screen test?



WordStar™ software does! And does it better than any other word processing system. Not only do you get all the sophisticated features you'd expect from the high-priced WP system, with WordStar you have a true screen image of what your printout will look like **before you print it!**

With WordStar, you'll erase, insert, delete and move entire blocks of copy. Page breaks are

displayed and automatically revised on the screen. You can specify enhancements like underlining and boldfacing, and much more.

And WordStar's so much easier to learn because of its unique and extensive self-help menus. Every typist in your office can be an instant screen star. Call (415) 457-8990 and ask for a copy of our WordStar demon-

stration booklet. Remember, when you're the star, we're the star.

MicroPro
INTERNATIONAL CORPORATION
The Star Maker

MicroPro International Corporation
1299 4th Street, San Rafael, CA 94901
(415) 457-8990 TELEX 340388
Sold through authorized dealers and
distributors only. OEM inquiries invited.

*Runs on most Z80/8080/8085 microcomputers with CP/M (TM of Digital Research); 48K, and terminal with addressable cursor.



'I Know How You Feel. I Own One of Your Computers!'

SPECIAL REPORT**Users Must Share Responsibility****Three Steps Can Help See Projects to Fruition**

By Frank Mann

Special to CW

NEWTON UPPER FALLS, Mass. — There is no such thing as an "average" application package. If it works, it's a significant achievement — but if it doesn't, it's trash.

Who is the culprit if there is a gap between the user's expectations and the applications package and the gap isn't detected until late in the game?

While it is easy to say the fault lies with the software supplier, making a package work is a shared responsibility, with the end user's role as important as the vendor's.

There are three ways to assure that a package functions effectively; and two of them occur before programming begins:

- Have a comprehensive design study performed by the software house before the project begins.
- Read the study when it is completed.
- Let the software house work on-site.

Worth the Cost

The design study is an easy way to short-circuit potential misunderstandings between end-user and vendor personnel. It describes in the user's terms what the package should do and how it should be done. Since a significant amount of research and preliminary system analysis goes into the study, it may add a small amount to the total cost. However, it can be regarded as a low-cost insurance policy for saving money by eliminating fundamental misunderstandings.

What happens, for example, when a prospective client asks a software vendor for an accounts receivable package?

The end user may define accounts receivable as the entire billing operation, including order entry, order processing, inventory control, sales commission breakouts and any of 100 other items taken for granted in the user's business. But the systems analyst may regard accounts receivable as nothing more than posting and tracking money owed.

This kind of misunderstanding happens more often than people are willing to admit.

A typical design study requires several days to several weeks of systems analysis, depending on the scope of the project. In addition, the user's staff must supply operating details. More time is necessary to generate the formal document. But when it is done, the project's requirements are spelled out and the user has four clear options:

- The user can determine that the specifications are right and the price is fair. Barring other complications, the package should be installed.
- The project can be stopped if the specifications are right, but the price or the people assigned to the project are wrong. Since the user owns the study, it can then be used as the basis for proposals from other software suppliers.
- If the project is stopped because of a high price tag, the study has saved the user from investing in a project

Implementing an applications package successfully involves substantial commitment from the customer as well as the vendor, according to Mann. Whether you are commissioning a consulting firm to develop a tailored package for your installation or considering the purchase of an "off-the-shelf" package, Mann has three suggestions for effective application program implementation.

that could not be completed. When more funds are available, the specifications and data can be used for new bids.

- Since the user can see the full project scope, he may opt for a phased implementation. The study remains a good investment because the data and

specifications assure the project's continuity even if it is implemented at intervals by different organizations.

If a study is commissioned, the user should naturally read the study and comment on it. However, design studies are detailed and lengthy and can intrude upon a busy manager's time. A typical study would contain six sections on the system's operation:

- A description, in the user's terms, of what each application or program module will do.
- A CRT screen layout section
(Continued on SR/26)

Looking For A Way To Unlock Your Programmer Productivity?

ACEP is a very efficient and easily learned conversational on-line time sharing system. Some of the major features of ACEP include:

- Foreground conversational execution of batch programs.
- Comprehensive text editor with full screen and split screen support.
- No modifications to operating system routines.
- VS1 and MVS operating system support.
- 3270, 2741 and ASCII dial-up terminal support.
- Terminals supported by CICS/VS, VTAM, BTAM and TCAM.
- No JCL restrictions for job submission and retrieval.
- Comprehensive displays of operating system status.
- Ability to enter system console commands from terminals.
- OS/VS utilities run in conversational mode.

Read What Other ACEP Users Are Saying:**A Timber Company**

We converted from VM/CMS to ACEP. ACEP is superior to VM/CMS and all other products we evaluated.

When compared with the other products we evaluated, ACEP's response time is exceptionally good.

ACEP uses less resources, responds faster and provides access to everything in the system easily.

A Food Processor

The response time is great and ACEP is a low overhead system. ACEP is easy to install, flexible and the service is exceptional. Our Accounts Payable and Personnel Systems are driven through ACEP.

A Foreign Oil Company

We evaluated the competition and chose ACEP.

An Oil Company

ACEP supplies our remote users a time sharing capability under CICS/VS.

A Major New York Bank

ACEP is very powerful for the systems programmer.

Our service has been very responsive.

A Theater and Distribution Co.
We have installed and used three different systems. ACEP is the best I have ever worked with.

We have always been able to do exactly what we wanted, ACEP imposes no restrictions on us.

ACEP installs quickly and easily.



- Security at command level and full control of data set access.
- Dynamic allocation of data sets.
- Private PDS libraries for each user.
- Interfaces to several source program maintenance systems.
- SMF accounting routines.
- User-written commands easily added.
- Constantly active "hot" reader for OS/VS1
- Procedure language with labels, arithmetic and string functions.
- Multiple working storage areas for each user.

A Major Manufacturer

We spent many years looking for a system. We evaluated many products before choosing ACEP. It is one of the cleanest systems I have worked with.

I like the way ACEP controls authorization. System security is very good. ACEP has the best editing facilities of all packages available.

A Foreign Oil Company

We have multiple end users interacting with our Data Base Management System through ACEP.

A Title Company

Users that come from TSO shops learn ACEP easily.

ACEP installation is very simple. The full and split screen editors are beautiful.

**Contact Names Available on Request.*

We've Got The Key.

Call or write for your free concepts and facilities manual now.

Get Productive — Go ACEP

ACEP

Software Module Marketing • Crocker Bank Building Penthouse
1007 Seventh Street • Sacramento, CA 95814 • (916) 441-7234 • Telex 377-314



SPECIAL REPORT

Page 26

Bankers Give Positive Accounts of 'IPS-One'

More than a dozen New England Banks have installed RCT-11's IPS-One package on Burroughs Corp. hardware and results are positive, based on an end-user minisurvey.

The package, which features multi-location terminal capability, comprehensive editing and a settlement technique at transaction, batch, block and run levels, is an on-line document reject correction and settlement, according to one of its initial users.

"The most unique capability is the chase mode — we correct rejects on an open run with the system," George Conley, vice-president of Shawmut Community Bank in Framingham,

Mass., said. "We can overlap our activity on the sorter-reader with the correction and settlement effort on the same run, and prove the bank much earlier."

The in-place correction also provides accurate float and item counts that are important to the balance-conscious corporate customer base.

"Our Burroughs B1800 was delivered on Saturday and we corrected our incoming on Monday. Although we retained our manual procedures, just in case, the staff now wants no part of the old system," Paul Shea, vice-president of Safety Fund National Bank in Fitchburg, Mass., commented.

"We were an early user of the system," A.J. Joyal, DP manager of the Vermont-based Randolph National Bank, added. "We anticipated the usual bugs of a new system, but were pleasantly surprised.

"Since we service several other banks, rapid throughput is necessary for us to make deadlines. Even with four or five terminals active, we experience minimal degradation," he noted.

RCT-II, the IPS-One development house, is a three-year-old firm staffed entirely by former bankers. Craig Reynolds, director of systems development, initially identified the need for a reject correction and settlement pack-

age while working with an early version of a Burroughs program product. "We have been through two release levels with no problems to speak of," he claimed.

Although utilizing most of the special features of the Burroughs TD830, the system also runs on TD800- or TD820-style terminals, he said.

Features include the creation of special "slow letter" reports for corrected transit items, optional automatic cursor positioning, a system log containing operator statistics and a demonstration/training package for new users.

Three Steps To Success

(Continued from SR/25)

describing screen formats and detailing the information to be entered or displayed.

- File layouts that define the data base and indicate whether the data is alphabetic or numeric and the size of each data element.
- A report requirement section describing all reports to be generated, including data elements in the report and any totals that are required.
- A section on hardware requirements such as the amount of disk storage, main memory and terminals needed to input and store data for each application. This section also lists the number and speed of the printers needed.
- A summary based on all the specifications listed above that lists the programs required and produces a production schedule.

User commentary involves reviewing the software firm's interpretation of the operation and analyzing the specifications. Will screen formats be compatible with the capabilities and requirements of the system's users? Will the file structure allow access to all data necessary to conduct business? What about future requirements?

These factors should be discussed by the vendor and potential customer in order to draft a final set of specifications. That leads to the final step.

While it is common for a software house to spend a week or two on-site and not be seen again until the completed package is delivered, this is not a good practice. On-site development and implementation allow vendor representatives to talk with the user's staff. When inevitable problems arise, the foundation for amiable discussion is already in place.

Since a software package is usually implemented in several phases, an on-site technical staff allows each part of a package to be tested by the people who will use it as soon as it is completed.

Commissioning a design study, reading and commenting on it and allowing the software house to work on-site are an effective methodology that should result in an application package that performs to user specifications.

Mann is founder and president of Mann Data, Inc., a consulting firm that specializes in software development, customization and implementation.

Award winning software packages for your DEC PDP-11

(operating under RSTS/E)

ICP Million Dollar Award and DEC AIP Gold Stars demonstrate our products' acceptance.

Inventory Control
Bill of Materials
Job Shop Control
Material Requirements Planning
Order Processing & Sales Analysis

Manufacturing Packages

General Ledger
Financial Planning
Accounts Receivable
Accounts Payable
Payroll

Accounting Packages

IMS-11, the Structured Software Tool

Program Development

Tighter control over spiraling inventory costs, recognizing production backlog before they develop and improved customer service are just some of the benefits of this set of packages. Some system highlights: multiple inventory costing methods, automatic rollup and recosting of bills, labor and work center utilization reports, shop load requirements and on-line "bucketless" MRP runs.

Our on-line, interactive packages provide you with immediate and always up-to-date accounting data. At a moment's notice you can verify customer credit, get account agings, pay vendors, and produce financial statements. Some advanced system features: multidivisional and multibank reporting, auto-cash application, variable dunning notices, A/P foreign gains/losses, budgeting, comparatives and G/L report writer.

As a direct result of our staff's combined 100+ years of RSTS/E experience, the development of our applications under IMS-11 insures that all our software conforms to the same rigid development and documentation standards. As a stand-alone programming tool, development time of new systems can be cut up to 50%. Features include: programming standards, record I/O, keyed access, linked list and other data management functions, screen control, IMS sort utilities, menu and report directors, and JCL generation language.

Call (617) 489-3550 or write:

ims

INTERACTIVE
MANAGEMENT
SYSTEMS

375 Concord Ave., Belmont, Mass. 02178

AUTHORIZED digital COMPUTER DISTRIBUTOR

SPECIAL REPORT

Page 27

At Canadian General Electric

Manufacturing Package Gives Trio of Benefits

GUELPH, Ont. — Software should dictate the selection of hardware rather than vice versa, according to Jim Gray, material manager at Canadian General Electric (CGE) here.

CGE's material group recently decided to modernize its operations to integrate all master scheduling, purchasing, inventory control, production control, traffic, customs, stores, receiving and operational planning within one system.

The firm, which manufactures large power transformers for utilities and employs more than 800 people, investigated many software packages and eventually selected the MS-11 Manufacturing System from NCA Corp. MS-11 was specifically designed for Digital Equipment Corp.'s PDP-11 family of computers.

One reason for choosing MS-11 was its proven customer base. "Proven" to us meant that the software had to be in use for at least a year," Gray said. CGE obtained a list of MS-11 installations and compared their results with its expectations.

Projecting that the modernization effort would pay for itself within a year and a half, CGE expected benefits in three categories. First, it hoped to reduce inventory by reducing queues of material ahead of final assembly. Second, it wanted to improve purchasing procedures with the use of commitment reports, better supplier tracking and negotiation. Finally, the group wanted to reduce clerical staff.

Real-Time Operations

The firm uses the material requirement planning (MRP) capabilities of MS-11 as an inventory rescheduling mechanism, Gray explained. When schedules change for any reason, the changes can be reflected at all levels down to individual purchased parts and raw materials. "Real-time operations are the key point in having confidence regarding the location of material orders and their due dates," he said.

Also contributing to inventory control are the commitment reports generated by MS-11. These reports provide a detailed and aggregate tally of all items promised to be bought from vendors in current and all future periods and are analyzed by Gray and his supervisors on a regular basis.

"When the aggregate for a current month is running higher than our estimate of what the aggregate should be, we can look at all the items and determine which jobs they are scheduled for," Gray explained. "From there, we decide which purchases should be delayed."

CGE uses the MRP reports to put pressure on suppliers to improve their material shipments. Whenever supplier sales and marketing people call on CGE buyers, they are taken to a terminal that prints out the open order status for that supplier.

Suppliers don't get additional orders until their open-order status "starts to get cleaned up," Gray noted.

MRP and open-order reports are also used to negotiate with suppliers for better prices. "It's a great starting

point at the bargaining table," he pointed out.

The firm is also developing a series of seminars on the MRP system for its suppliers. "If we can give them the whole picture of what is on order, say six months out, they can plan their production accordingly," Gray pointed out. "At the same time, we work with them to outline the close-in, this-month priorities. They can adjust their current production to our needs without touching their total dollar outlay or their total volume load."

"That's the whole essence of MRP,"

he continued. "You make people work on what is needed at any given moment, as opposed to what was originally ordered."

Paperwork Phased Out

The reduction of clerical staff, related files and paperwork was accomplished through attrition. Inventory control, purchasing, receiving, stores and a large part of operational planning are now handled in real-time mode on one of 17 materials-dedicated terminals.

"We haven't typed a single purchase order since last July," Gray noted.

Opting for gradual growth, CGE first adopted the MS-11 inventory control, purchasing and receiving segments. It is now bringing up the operational planning capability.

CGE has followed an innovative implementation strategy, according to Gray. As a section is added, terminals are brought in and left for a few weeks until department personnel become curious about them. Then an experienced secretary is sent over to demonstrate the terminal. After that, the local supervisor is trained, and he becomes

(Continued on SR/28)

Distributed Data Processing: Coming of Age.

Read all about it in the February 23rd issue of Computerworld.

How DDP has evolved, its present focus, and the direction it is taking will be the subject of this Special Report. We'll also cover the problems and promises of DDP the most popular "buzzword" of the 70's and a definite reality of the 80's.

Edited by Tim Scannell, you'll read tutorial and case histories describing:

- The change from a centralized to a decentralized system: the history behind the change and why.
- Security: its importance increases as traffic and networks increase. The more decentralized the system, the more open to abuse. What approaches to DDP security have users found effective, and where have supposedly fail-safe security systems failed?
- Management aspects of DDP: its clear that as the system grows, so do management problems. What are the solutions?

If you're a user who watches the trends, you'll want to have the most up-to-date information about DDP and you'll find it in our February 23rd Special Report. And if you're marketing products or services in the DP field, you'll want to make sure your ad is there. Ad close is February 6th. Contact your Computerworld salesman, or call Frank Collins at (617) 879-0700.



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BOSTON

Bob Ziegel
Chris Lee
Ed Marecki
Kathy Doyle
Susan Wolfe
(617) 879-0700

CHICAGO

Dave Dolber
Bob Ziegel
Jan Heaney
(312) 827-4433

NEW YORK

Don Fagan
Mike Masters
Peter Senft
Candy Kelly
(201) 967-1350

SAN FRANCISCO

Bill Healey
Barry Millione
Ruth Gordon
Althea Gould
Linda Tucker
(415) 421-7330

LOS ANGELES

Jim Richardson
Bob Hubbard
Kathy Knox
(213) 450-7181

SPECIAL REPORT

Page 28

Handles Fivefold Jump in Volume

Accounts Payable Package Beats 150 Rivals

ARLINGTON HEIGHTS, Ill. — Faced with a five fold increase in monthly checks after a major acquisition, McGraw-Edison selected McCormack & Dodge Corp.'s (M&D) A/P Plus package over some 150 competitive products to handle the volume.

In addition to performing research on more than 150 software vendor's packages, the firm's representatives conducted lengthy interviews with five finalists. A/P Plus satisfied more of McGraw-Edison's criteria than its competitors with features that included "a good report writer, the ability to handle one-time vendors, more user installations and better training," according to a spokesman.

"Ultimately, we looked at the vendor's documentation," Lyle Murphy, director of the shared management informa-

tion systems (MIS) group, noted. "Computer time is cheap, but people time is very expensive and documentation can have a great impact in terms of software implementation and maintenance. M&D demonstrated they could provide us with good documentation."

McGraw-Edison manufactures and supplies electrical and mechanical products and related services designed for a wide range of industrial applications. The company is organized into six business groups and a total of 15 divisions plus its corporate offices in Elgin, Ill., and employs approximately 38,000 people in 178 manufacturing facilities around the world, a spokesman said. With the acquisition of Studebaker-Worthington, Inc. in October 1979, the firm's combined annual reve-

nue base exceeds \$2 billion, he said.

McGraw-Edison formed a corporate MIS program in 1978 to assist in solving systems problems and facilitate cost-effective operations, he explained.

Software Needs

At the program's inception, the company identified a need to share software systems wherever possible. The primary purpose was to reduce the cost of multiple items including the software itself and corporate manpower requirements both within and outside of DP environments, he said.

Given the number of outside vendors for the lighting division and the corporate offices that were paid through a manually-operated accounts payable system and the pending acquisition of Studebaker-Worthington, the company perceived a clear need to automate the accounts payable function, he noted.

The lighting division paid out an average of 1,600 monthly checks and the corporate accounting office expected the number of monthly checks to increase from 275 to 1,500, he said.

It was projected that automating the accounts payable system would provide im-

proved and more accurate information as well as faster reporting mechanism than had been possible under the previous manual system. Additional reports were required to calculate expenses and determine inventory levels and pricing trends more quickly, and to interface with the divisions' other automated and manual systems, he pointed out.

Since multiple divisions would use the accounts payable system, representatives from the corporate office and two divisions participated in the process that culminated in the selection of the M&D package.

In addition to allowing McGraw-Edison's corporate office to handle a major acquisition and five-fold increase in monthly checks, the A/P Plus software also provides timely, needed information to allow better planning at the division and corporate levels despite a skittish economy and rising prices, a spokesman said.

The package was purchased in October, 1979 and was installed in approximately two weeks. After bringing up the corporate office in November, the MIS group brought the company's lighting division

on the system and began processing its 1,600 check

monthly workload, according to Frank Contreras, senior financial analyst.

Batch Mode

The A/P Plus package runs in batch mode on a 12M-byte IBM 3033 mainframe running under an MVS operating system. The computer system is located in the company's corporate data center with each division using remote job entry (RJE) terminals for data entry and management reporting, he said.

Murphy expected a total of eight divisions using the package within the next two to three years. The company also has some 10 IBM DOS sites, some of which will use different copies of the A/P Plus software running at the corporate data center.

For the firm's corporate group, installing the shared A/P Plus system meant not having to increase its accounting department staff despite the increased administrative overhead resulting from the Studebaker-Worthington acquisition.

Another reporting feature allows each using division to track and reconcile employee travel and expenses automatically, thereby reducing the number of people that must check employee expense reports and minimizing errors.

The accounts payable system "represents the business we do and how we do it. It's a reflection to the outside world of our internal business operations," Contreras said.

Trio of Benefits Realized

(Continued from SR/27)
responsible for training the entire section.

While CGE has made several minor adjustments to the software, most were necessitated by Canadian business practices and the need to operate in a multinational environment. The company needed conversion factors built in to compensate for different currencies and metric/standard measurement.

Addresses also had to be developed for intracountry exchange. NCA provided these and, in fact, incorporated some of them into its packages.

CGE now uses only about half of the available MS-11 reports, but Gray expects to use more of the standard reports and to add some custom reports as modernization progresses.

The modernization process has had a decided effect on the entire operation of the plant, according to Gray. Many of the older internal parameters are being reevaluated and standard lead times and inventory closings are now in question.

"The rules were written in a

BUSINESS APPLICATIONS

TOLAS-II
DEC RSTS/E

ICP Million Dollar Award Winning Products, from the World's First Commercial RSTS Service Center.

DISTRIBUTION SYSTEMS

- Order Entry/Invoicing
- Inventory Management
- Sales Analysis
- Purchasing

TRANSCOMM DATA SYSTEMS

1380 Old Freeport Road
Pittsburgh, PA 15238
412-963-6770
415-433-7123

AUTHORIZED **digital** COMPUTER DISTRIBUTOR

TSO USERS!
THE Applied Software
TSO/SUPERSET-UTILITIES
IS THE
BEST ALTERNATIVE
TO IBM

Compare:	Applied Software's TSO/SuperSet Utilities	IBM's TSO Data Utilities
Cost	\$130/Installation	\$144/CPU
Software Support	Class "A"	Class "C"
Full-Screen Support	Yes	No
132 Column CRT Support	Yes	No
LISTJES Command	Yes	No
(SYSOUT Previewer)	Yes	No
TSOSORT Command	Yes	No
JTIP Interface	Yes	No
Fast Merge	Yes	No

WRITE OR CALL FOR FREE BROCHURE AND TECHNICAL COMPARISON

Applied Software, Inc.

4440 P.G.A. Boulevard, Suite 204
Palm Beach Gardens, Florida 33410
(305) 626-4818
OVER 300 TSO CUSTOMERS WORLD WIDE

TONE
NOW
ACCEPTING APPLICATIONS
FOR CUSTOMERS

REQUIREMENTS:

VSI users in need of TSO capabilities

MVS users in need of enhanced TSO

TONE and TSO users in need of enhanced full screen editing

TONE, TSO, CICS and ROSCOE users in need of capabilities well beyond the standard output processor.

PROGRAMS AVAILABLE ARE:

TONE 3, TONE 4, FSM, FSO

APPLY DIRECTLY TO:

TONE
Software Corp.
1735 SO. BROOKHURST ST.
ANAHEIM, CA 92804
PHONE: (714) 991-9460
TELEX: 181592

SPECIAL REPORT

Page 29

Software Smooths Utility's Shareholder Activity

MINNEAPOLIS — Annual savings of \$6,000 to \$8,000 on transfer fees alone resulted from the Northern States Power Co.'s (NSP) decision to administer shareholding activity in-house with the help of Informatics, Inc.'s Corporate Shareholder System (CSS) package.

The electrical utility company has approximately 100,000 shareholders with common stock and three different classes of preferred stocks, according to a spokesman.

Most corporations turn the exchange of share ownership over to financial institutions that act as transfer agents, according to an NSP spokesman. The transfer function includes recording shares bought and sold (transfer of ownership), processing the transfer of certificates to new owners and complying with other legal requirements.

This activity allows the company to know how many stockholders it has, who and where they are and how many shares they own, so it can periodically send financial information and dividends to them and report various transactions for tax purposes, the spokesman said.

NSP used three transfer agents until it licensed CSS in 1977, he said.

Better Service

"With a computerized system, you can offer the shareholder better service," Fred E. Eiselein, administrator of shareholder services, noted. "We used the transfer feature to realize a savings of \$6,000 to \$8,000 a year on the transfer fees." The system also provides good response to shareholder inquiries via two dedicated on-line terminals, he said.

In addition to the two IBM terminals reserved for shareholder relations' inquiries, two others are used for accounting entries, transfers, debits, credits, file maintenance, address changes, Social Security number changes and dividend reinvestment entries, NSP said.

New York Stock Exchange (NYSE) rules require that any company listed on the exchange have a registrar in New York, Eiselein explained. A transfer agent's function is to eliminate the possibility of mistakes when a stock certificate or proof of ownership is transferred from one person to another. The firm also had a transfer agent in Chicago since it is the financial hub of the Midwest and many NSP stockholders are located in or near Chicago, he added.

Whenever there is a problem tracking back transfers, it usually involved recordkeeping in one of these two cities, according to Eiselein. Most of the activity was through New York because even local brokerage houses send stocks there for transfer. "We thought it would be a lot cleaner if we did all the recordkeeping here in Minneapolis," Eiselein said.

NYSE rules allow a company to become its own sole transfer agent under Rule 496 which states that the company must have a bank depository or "drop agent" in New York City where it can leave and pick up certificates. The rule also requires a company to process certificates within 48 hours after they are submitted by the broker-

age house. A number of banks in Minneapolis provide a "drop window" for companies that want to act as their own transfer agents, Eiselein said.

Brokerage firms in New York carry certificates to the drop agent, which examines the documents and sends them by courier to NSP. "We currently use an air freight service since the certificates must be here early in the morning," he said. This allows the internal transfer agent to review them so data entry clerks can enter them on the terminals.

Assuming we're still on schedule, the certificates are printed on a remote terminal in shareholder services at ap-

proximately 1:00 p.m.

The new certificates are sent to registrars at one of two Minneapolis banks for signature, he continued. While the courier waits, the registrar finishes recording the certificates and the package is sent back to New York on the same afternoon. "We are able to meet the 48-hour requirement following this procedure," he claimed.

In addition to transfer activity, Northern States Power also utilizes the CSS Dividend Reinvestment-Full Accounting Employee Stock Option Purchases (Esop/Trasop) module. This allows employees to reinvest dividends or make additional cash purchases of

stock and make it possible for NSP to do the recordkeeping on such transactions, he said. About 15% of the shareholders representing 7% of our shares participate in the dividend reinvestment plan, according to Eiselein.

"We started dividend reinvestment with an open market plan about eight years ago, purchasing shares on the open market with dividends of those people participating [in the plan]," he recalled.

In 1976, NSP went to an original issue plan where the company issued shares instead of buying them on the open market and then brought transfer activities inside NSP.

Introducing China Computerworld

The only specialized computer publication written exclusively for the People's Republic of China (PRC)

The PRC is a huge country with a relatively small installed base of computers. But the future looks very bright for the Chinese EDP business.

Government plans call for extensive use of computers in the PRC's technological modernization, and annual EDP expenditures are expected to grow into the billions in the 80's. A good deal of this money will be spent on foreign computer equipment, and the decision-makers for this equipment will be using **China Computerworld** to help them in choosing the products and the companies they need.

China Computerworld is a joint venture of the Fourth Ministry of Machine Building and CW Communications/Inc. and it includes among its 25,000 subscribers the key government officials and computer managers who have EDP purchase decision authority.

China Computerworld will have three monthly issues in 1980, and will be published twice a month beginning in January, 1981. It has tabloid size and a newspaper format, and gives you a unique opportunity to introduce your products and services to this sleeping giant of a marketplace.

For more information, just give us a call or send in the coupon.

Diana LaMuraglia, Manager, International Marketing Services

CW COMMUNICATIONS/INC.

375 Cochituate Road
Framingham, MA 01701
(617) 879-0700

Please send me more information on

— **China Computerworld**

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

— Your Other Foreign Publications



CW COMMUNICATIONS/INC.
Publishers of *Computerworld* and other leading computer publications around the world.

PEOPLE WHO KNOW, SAY OUR SOFTWARE IS THE BEST.

In a recent DATAMATION software survey conducted by Data Decisions and Beta Research, 2,373 users rated more than 100 software packages.

They picked the Software International General Ledger and Financial Reporting System as the best-performing package in terms of Overall User Satisfaction in its product category. This simply means our system obtained superior ratings for installation and initial use... service and support... day-to-day operations... and ease of input/output.

These discerning users judged our features-vs-cost comparable or better than other General Ledgers. That doesn't surprise us, because we've sold more General Ledger packages than any other vendor. Our existing customers continue to order and install Software International's other outstanding financial and manufacturing packages in record numbers. That's because they need the performance only we can deliver.

We're proud that our users have made us the leader, and we're more committed than ever to staying out in front!

**General Ledger and Financial Reporting
Payroll/Personnel • Accounts Receivable
Accounts Payable • Fixed Asset Accounting
Work Order Management
Manufacturing Resource Planning**

**SOFTWARE
INTERNATIONAL®**

Elm Square, Andover, MA 01810 (617)475-5040

Atlanta (404) 955-3705
Boston (617) 729-8962
Chicago (312) 298-3500
Columbus, OH (614) 773-2167
Houston (713) 444-3348
Los Angeles (213) 573-0402

New York (914) 253-8050
San Jose (408) 292-9700
Montreal (514) 866-5728
Toronto (416) 924-1461
Vancouver (604) 669-6122

OFFICES AROUND THE WORLD

CALL US. WE'RE THE LEADER.

SPECIAL REPORT

In-House Effort Worth It?

Benefits, Risks Examined in Package Selection

PENNSAUKEN, N.J. — With more than 30,000 software packages commercially available, based on an estimate by Raymond Wenig of International Management Services, Inc., why spend the money and time to develop in-house applications?

Wenig investigated this and other application software acquisition questions in a report entitled "Searching for Software" from Auerbach Publishers, Inc. here.

The prospects for locating appropriate application packages are limited by two major factors, according to Wenig. One is that software simply does not exist for all applications and the second is that not every package runs on every hardware configuration. A logical rule of thumb is that the more common the application area, the more likely that usable software will be available.

However, since a large number of packages are written for such general applications as payroll/personnel, inventory control and accounts receivable, it is more difficult to identify and locate suitable packages for a particular environment, the report continued.

Wenig listed hardware vendors, software developers, turnkey companies, end users, computer hobbyists, government agencies, trade associations,

universities and cooperative libraries as possible sources of software. While there is no common directory offered by these sources, various catalogs and listings are available for the prospective purchaser (see Figure 1). These sources do not list all available software since many firms with reusable software do not perceive this area as a main line of business, Wenig cautioned. If contacted, however, these companies often consider selling systems to appropriate buyers.

Risk Factors

While time and cost savings together with access to a proven system make application packages attractive to many DP organizations, there are also multiple risk factors to be considered, the report noted. These include search and time costs, the impossibility of modifying functional requirements, program modification costs, unique construction details, poor documentation, lack of maintainability, hardware configuration variances, minimal or nonexistent vendor support, inefficient throughput, growth limits and unknown or latent bugs in the code.

Since software packages seldom match user requirements exactly, the cost of modifying the programs is one factor that should be examined very

carefully, Wenig stressed. The required modifications are sometimes more risky and difficult to design and build than a new system. In addition, the package limitations and idiosyn-

Since software packages seldom match user requirements exactly, the cost of modifying the programs is one factor that should be examined very carefully. The required modifications are sometimes more risky and difficult to design and build than a new system.

cracies are often neither obvious nor well-documented, the report noted. In fact, the "cost of modification often exceeds the [original] cost of acquiring the software."

Therefore, Wenig maintained, the decision to purchase a software package should be based on the cost of acquisition plus the cost of the required modification adjusted by the risk of its successful implementation. And, although the acquisition cost can be estimated carefully, the modification cost should include "sizable contingency value to compensate for unknown and unpredictable difficulties," he said.

End users must be involved in defining the required modifications in reference to the package under consideration, the report continued. The evaluation team and/or the product vendor would develop a list of changes needed

to meet the requirements statement.

The next step involves selecting the party who will make the changes. Logical choices for this assignment would be the software creator, internal programmers, a third-party software vendor or other users who have made similar modifications, the report stated.

Other Methods

Two other methods were suggested to circumvent the modification problem. One is to use the package "as is" by developing interface modules to perform the desired results. The second is to extract the major elements from the software package and build routines to perform the required functions. Regardless of which method is chosen, Wenig repeated that "it is imperative to weigh the risk of making the modification."

In addition to program modification, some adjustment in the system development life cycle will result from acquiring an application package, according to the report (see Figure 2). The design phase is usually most affected since it must include the software search, evaluation, acquisition and modification. However, even if these steps fail to produce an acceptable package on a permanent basis, Wenig suggested that a package might be acquired as a temporary measure while a tailored system is developed by the in-house staff.

Additional reports on software acquisition are available from Auerbach at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Type of Listing Source	Example/Contact	Cost	Type of Software	Remarks
Vendor Software Lists	Most major equipment makers (IBM, Burroughs, NCR, etc.)	Free	Special vendor packages Field-developed systems	Lists only programs for vendor systems Irregularly updated
Vendor Referral Directories	Several mini-computer vendors (DEC, DG, Data-point, etc.)	Free	Programs produced by contracted OEM vendors Usually applications-oriented	No quality guidelines Irregularly updated
User Group Libraries	Most computer vendors (IBM-SHARE, DECUS, etc.)	\$5-500 membership fee	Variety Mostly subroutines and utilities Few applications	Standardized abstracts Irregularly updated
Published Directories	ICP Directories AUERBACH Applications Software Reports Minicomputer Software Quarterly RSI Catalog of Minicomputer Software	\$65-350 subscription (usually 1 year)	Mostly applications	Regularly updated Many cross-reference indexes
Trade Associations	National Association of State Information Systems Office Products Auto Parts	Varies	Trade applications	Not updated Variable content and quality
Government-Supported Agencies	COSMIC — University of Georgia Federal Software Exchange	\$0-75	Wide range of government-sponsored software products. Technical and commercial applications	Detailed listings Irregularly updated
Technical Press Advertising	Computerworld Datamation	\$0-25/year subscription	Proprietary systems from software vendors	Variable content No indexes
Search Publications	Computer Hotline User Groups	\$0-50/year membership	Requests for specific software sources Listings of new offerings	Regular publication No indexes Repeated requests

Figure 1. Software Location Chart

Phase	Activity	Time Range	Pitfalls
Define Requirements	Specify required and desirable features	2 weeks to several months	Incomplete specifications Not separating requirements from desirable features
Search for Suitable Packages	Match program requirements to available packages	1-4 weeks	Finding no matches Insufficient information
Package Evaluation	Review and evaluate software packages for match to requirements	2-6 weeks	Learning package details
Software Acquisition	Negotiate and contract for acceptable software package	1-4 weeks	Lack of agreement Compromises
Modification Planning and Design	Detail the required modifications	2-8 weeks	Difficulty in defining the required modifications Inadequate documentation
Modification and Testing	Build and test the modifications	Varies	Inadequate test data Modifications that do not work Inefficient modifications
Implementation	Install and cut-over to the modified system	2-6 weeks	Misinterpretation of the requirements Operational flaws
Performance Review	Evaluate the system and plan future modifications and enhancements	4 days to 2 weeks	Inappropriate expectations System or modification flaws

Figure 2. Modified Development Life Cycle for Software Evaluation, Purchase, Modification and Reuse

OUR SMART TERMINAL IS ONE TOUGH COMPETITOR.

It's not easy buying a terminal today. There's a lot of names to choose from. So consider the facts, then make your decision.

THE AMPLEX DIALOGUE 80™ TAKES THE COMPETITION ON.

The Dialogue 80 is one tough competitor. Comparing our interactive, desk-top editing terminal to most other terminals costing hundreds of dollars more is very revealing.

For instance, most do not offer a detached keyboard. We do! Most do not offer a self test. We do!

And most do not offer a status line. Ours comes with a continuous display of current operating modes, functions, error/fault conditions and more!

The list continues with third and fourth memory pages. We have it! Most of the others do not.

And truly programmable function keys? Once again, we have it. Most of the others do not.

For hundreds of dollars less, the Dialogue 80 gives you a host of standard features the others do not. When you take a closer look, the Dialogue 80 is the smart terminal buy!

ENGINEERED FOR TODAY.

With everything the Dialogue 80 has going for it, you'd expect it to be designed for today's needs. And it is. With a long list of "friendly" features that make operation easy and comfortable.

That means machine and man interact successfully. And it also means the Dialogue 80 contributes to a productive environment.

CALL US TODAY. WE HAVE THE ANSWERS.

We're confident we have the right terminal. From our Dialogue 80 to our Dialogue 30, one of the best priced terminals on the market today.

So, if you still have questions on which is the best terminal buy, call us. Ampex has the answers with the Dialogue 80 designed and priced for the OEM and systems house.

Call Harvey Hirsch today at Ampex Corporation, Memory Products Division, 213/640-0150, 200 North Nash Street, El Segundo, CA 90245.

AMPEX

MAKES THE DIFFERENCE.

©Ampex 1980



SOFTWARE & SERVICES

Directory-Driven Approach Communications System Spans Alaska

ANCHORAGE, Alaska — More than a half-million square miles is a large area, but Alascom developed a communications network utilizing Cincom Systems, Inc.'s Total Information System (TIS) that brings Alaska's borders closer together.

Alascom took over the Alaska/Communications system from the U.S. Air Force in early 1971 and has been expanding and upgrading the state's long-distance system ever since in order to keep pace with a rapidly expanding population, a spokesman explained.

The organization realized that satellite communications systems

were necessary to meet the commitment to expansion because of Alaska's scattered population, rugged terrain and severe climate, he said.

"Our initial move to the data base environment enabled us to begin integrating our data and thereby provide the information we needed to initiate many of our progressive communications plans," John Ayers, director of management information systems (MIS), said.

Initial Conversion

Cincom's Series 80 Total data base management system (DBMS) and Environ/1 telepro-

cessing (TP) monitor supported Alascom's initial conversion to data base in 1977. Although this step improved overall productivity and response to the customer environment, the organization was looking for an additional tool within two years.

By 1979, when Alascom became a subsidiary of Pacific Power & Light, managers were already asking for software that would help them to manage their areas more effectively.

Coincident with these discussions, Cincom announced TIS, and Alascom management felt that a move to the TIS directory-driven approach was in keeping

with future plans. "It provided the ability for the manager, himself, to work with the system through query to extract the required information," Ayers said.

The product was installed in March 1980, and Alascom's current TIS system includes directory, directory maintenance online, DBMS, communications monitor, comprehensive retrieval, on-line and batch query, utilities, Cobol XT, task-level recovery, advanced mapping and standard access method components.

Logical Link

Alascom's information data communications system (Aids) will be based on the TIS software with the objective of providing easy access to data on demand while keeping in mind "obvious security restrictions," according to a spokesman.

"Our user-oriented system is being designed to create a logical link between [the data bases] where the information lies and the place where it needs to be

(Continued on Page 68)

Four Features Added

'Panvalet/On-Line' Backs IBM 3278

OAK BROOK, Ill. — Release 3.0 of Panvalet/On-Line adds four features along with support for the IBM 3278 terminal.

The dual-screen facility allows a user to create two logical screens from one logical screen, the vendor claimed. In addition, the product features the ability to have two independent Panvalet-/On-line sessions active at one time on the same physical screen.

That allows the user to view two members or two portions of the same number together and the editing of either the top or bottom screen portion (the cursor position determines the logical screen in control).

The full-screen mode facility enables a user to perform multiple edit functions with one terminal transmission, a spokesman said. For example, a user can add, delete and change lines in the terminal data area and issue an unrelated command in the command line and only require one terminal transmission for all those activities to be processed.

The PF key support is a mechanism allowing high user Panvalet/On-line commands to be assigned to a single key function. All functions are defined as command sequences and set at installation time. A default set of 12 PF key definitions is supplied but a user may change them, cus-

tomizing them to his environment, the spokesman said.

Support is now provided for the 3278 models 2, 3, 4 and 5. Panvalet/On-line will identify the terminal model it is communicating with and set the

screen size dynamically, the spokesman said.

The system costs between \$5,000 and \$7,000, depending on configuration, the vendor said from 709 Enterprise Drive, Oak Brook, Ill. 60521.

'Foundation' Built for Non-DP Execs

PRINCETON, N.J. — A software package that reportedly allows business executives with no DP experience to retrieve, manipulate and display data in an interactive environment has been developed by Applied Data Research, Inc.

Foundation is said to provide the facilities needed to describe and access data files, perform input, validation and manipulation of data values, generation of reports and creation of new data files.

Foundation, which also features a file editor, is not a traditional data base management system (DBMS), according to a company spokesman. While a DBMS is primarily designed to be used with structured data files, Foundation reportedly can retrieve information from various sources and formats as though they were one virtual data base, he explained.

The system features concurrent access of up to 10 data files in a variety of modes, flexible report generation, data item dictionary, data validation for entry and update and ability to create new files for internal or external use.

Foundation may now be installed on Digital Equipment

Corp.'s Decsystem-10, Decsystem-20 and VAX processors and on IBM's 370, 30 series and 4300 under CMS and TSO.

A first-site license fee costs \$30,000 from the firm's Application Products Information Center, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

'Datacom/DB' Updated

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced a version of Datacom/DB that allows operation of the data base in a virtual machine environment under IBM's conversational monitor system (VM/CMS).

Release 7.2 also features multiple data set support to provide for logical areas that span multiple physical data sets, designed to eliminate "the traditional operating system limitation of 16 extents," a spokesman said.

Dynamic allocation of logical areas reportedly will allow areas to be allocated when needed, rather than being available all the time. In addition, a new user exit available during recovery will allow backout of non-data-base records.

A permanent license for Datacom/DB under VM/CMS costs \$57,000. Monthly, three- and five-year leases are also available from the firm at Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Feel Betrayed Again?

You want to run ISAM on your FBA disk drives in native mode but you can't.

Seems like everytime IBM's new hardware takes you 3 steps forward, their software takes you 2 steps backward. That's just what happens if you want to run your FBA 3310 or 3370 disk drives in native mode. You must convert all your ISAM to VSAM. Now PSAM lets you run your ISAM programs on FBA in native mode. You don't have to convert to VSAM, or re-train your programmers. You can experience through-put improvements of 30% to 90%.



reduced disk requirements, improved on-line response time, and much more. And, PSAM is so much faster to install and easier to use than VSAM. If you must eventually convert to VSAM, PSAM can help you avoid a crash conversion by letting you convert at your pace rather than IBM's. So don't feel betrayed again! Clip the coupon or call us toll free now!

Universal Software

Brookfield Office Park
Brookfield, CT 06804
TEL: (203) 792-5100

OUTSIDE CONN: CALL TOLL FREE: 800-243-9542

Send me more information on PSAM with native mode support.

I'm running native mode now.

I'm emulating 360/370 disk drives.

I don't need FBA support, but I want to learn more about PSAM.

Name/Title _____

Company _____

Street _____

City/State/ZIP _____

Phone _____ CPU _____ Release _____

System Spans Half-Million Square Miles

(Continued from Page 67)

processed and delivered with a minimal amount of traditional MIS interface," John Toole, manager of systems and programming, explained. "It is also the logical link to administer communications between key locations and the remaining Alascom manned locations."

The Aids system is expected to tie each of the Alascom locations together as a network; to manage the flow of administrative data; to provide access to all the data bases stored at various time-share houses used to supplement the company's own processing system; and to integrate all the user data bases with the necessary editing, updating and reports performed by the users along with controls/security to

protect confidential or important data files.

The company currently processes its information DP function with an IBM 3031 and additional help from outside time-sharing services. It plans to consolidate all outlying data bases to a centralized system under TIS by mid-year, a spokesman said. There are 73 3270-type terminals comprising the TP environment with 43 terminals allocated to user environments, and plans call for a total 110 terminals in 1981.

Currently available under TIS are the system service order (SSO) system and an order status system which support approximately 20% of the corporate

revenue, he continued. The SSO system provides a data base with on-line updating which captures an order at the time marketing accepts it from the customer and controls the order through the whole process including the recurring billing cycle.

The order status system provides a data base for status of all types of service orders in progress. Authorized departments input the status of a given order and access this information by various keys such as order number, order type or status data field. The system also provides users with the capability of adding English-language remarks to identify status input in more detail, the spokesman said.

The firm had acknowledged a five-to-10-year commitment to the TIS concept, according to Ayers. However, it is possible that Alascom may consolidate its data center with the communications arm of Pacific Power & Light, Toole noted. This would probably mean a move to Vancouver, Wash. and he wasn't sure which of several DBMS would be used there.

In the meantime, 13 additional systems are expected to go up by mid-1981, and these projects include:

- **Payroll/Personnel data base:** Provides payroll and employee relations with access to more than 300 data elements related to an individual employee and provides other departments access to nonconfidential data and to edit/balance individual time reports.

- **Separations data base:** To break out distribution of revenue by area received.

- **CTI:** A system to track investigation of fraud calls and to correct and/or recycle rejected calls for subsequent rebilling.

- **Financial data base:** Includes general ledger, accounts payable and the Alascom chart of accounts.

- **Engineering data base:** A project, financial and control status system which will provide on-line updating maintenance and reporting capability of all engineering projects.

- **Customer data base:** An expansion of the existing customer master file will be linked to the order status and SSO systems and will continue all data relative to customer billing, addresses and credit ratings.

- **CPEX data base:** Will include all information regarding the Alascom communications network and will link to the SSO, order status and financial data bases.

- **Toll paper ticket system:** A system for collecting toll-call information to conform to AT&T standards.

"Our development and implementation schedule is very intense over the next year," John Toole acknowledged. "But under full operation, we estimate an 80% reduction in programmer report writing."

Directory Concept

A significant advantage Alascom found in its move to TIS is the directory-driven concept. This technology represents the major control point that enables DP to adapt to the changing needs of the user, the company said. It keeps track of all data items, their characteristics, locations, usage, users and their roles in satisfying information needs.

"By defining data at the element level, we have been able to gain a higher level of control, while expanding the accessible data significantly within just the last three months," Jim Capra, information systems coordinator, said.

The logical views created in the directory map the entire system in the directory reports. This allows the programmer to navigate the system efficiently and reduce his programming time, he maintained.

"With TIS, we have also been able to increase the overall security of the system," Capra noted. The logical view provides ease of access to both programmers and end-users and maintains the proper security features required to run the system."

Inventory Eased For HP 1000s

SEA GIRT, N.J. — Polaris Systems, Inc. has announced IMS-1000, an inventory and manufacturing system which reportedly gives a complete order entry, purchasing, inventory and production control system for Hewlett-Packard Co. HP 1000 users.

IMS-1000 features on-line inquiry of inventory status, parts availability, order status, where-used analysis and bill of materials explosion, a company spokesman said.

Minimum equipment required is an HP 1000 with RT II, III or IV, the Image data base management system and any of the HP-264x series CRT terminals.

Prices range from \$7,500 to \$30,000 based on modules selected, from Polaris Systems, Inc., 2100 Old Mill Plaza, Sea Girt, N.J. 08750.

'PMS' Updated For Prime Users

SCRANTON, Pa. — Computer Techniques, Inc. has enhanced its Proven Management Solutions (PMS) package for Prime Computer, Inc. hardware configured to run the Primos or Midas operating systems.

Enhancements include an active data dictionary that can be accessed from a relational-type data base, data file support, easier access from processors and extended systems administration and general features, the vendor said.

PMS costs \$9,600, including the enhancements, Computer Techniques said from 1015 N. Main Ave., Scranton, Pa. 18504.

TI 990 Gains Applications Aid

E. THETFORD, Vt. — Synergistic Systems has announced Adapt-990, an interactive program that simplifies the design, programming and documentation of Basic application programs for Texas Instruments, Inc. 990 CPUs.

Features include automatic documentation of file structures, multiple indexing, indexes across files, data storage management and input data validation, the vendor said.

The package costs \$2,495, the vendor said from Cobble Hill Road, E. Thetford, Vt. 05043.

"I'll pay your IBM maintenance bill"



I'm Bob Rich,
General Manager of
Computer Maintenance
and Leasing Corporation.

A few years ago we had an idea that has changed the way a lot of people think about computer maintenance.

The idea is a simple one: you don't have to sign an IBM Maintenance Agreement in order to get IBM service, parts and personnel.

When you purchased your IBM system, you were given a choice of two maintenance plans:

IBM Maintenance Agreement — where you pay a fixed monthly fee for all normal services as needed.

Per Call — where you pay an hourly charge up to \$91 plus parts, plus travel, portal to portal.

We at CMLC will provide you with a comparable maintenance agreement for considerably less. You get service from IBM engineers using IBM parts. But then IBM bills us at the per-call rates.

In other words, you get the security and budgeting control of the IBM Maintenance Agreement, at significant savings, and we promptly pay all the IBM bills.

Furthermore, we offer increased services, such as extended hours of maintenance coverage... 11 hours per day, versus 9 hours under the standard IBM Maintenance Agreement... mechanical replacement of "problem" machines and a complete preventive maintenance program.

Sound too good to be true? If you're one of those people who doesn't believe that it's possible to get more for less, call us toll-free at:

1-800-328-3655

(In Minnesota, call 612-473-3608 collect)

We'll give you the names of people in your area who have found that it's more than possible. It's simple.

CMLC
computer maintenance
and leasing corporation

1009 Twelve Oaks Center
15500 Wayzata Boulevard
Wayzata, Minnesota 55391

We deliver in hours because a lot can happen overnight.

A lot of unnecessary waiting. And worrying. American Airlines Priority Parcel Service doesn't make you wait overnight. We can deliver your small parcels virtually anywhere in hours. In hours! To every part of the continental U.S., Hawaii, Canada, Mexico and the Caribbean. And when you call toll-free (800) 638-7320, we'll even provide door-to-door service any time of the day or night.

So call American for delivery today. And rest easy.

AmericanAirlines Priority Parcel Service
Doing what we do best.

Syntax Converter Translates Univac Cobol to IBM Cobol

BUFFALO, N.Y. — Dataware, Inc. is offering a syntax conversion system to Sperry Univac 1100 sites that wish to convert their Cobol programs to IBM Cobol. The five possible Cobol transitions include U1100/FD to IBM OS, U1100/FD to IBM DOS/VSE, U1100/Asci to IBM OS, U1100/Asci to IBM DOS and U1100/Asci to IBM DOS/VSE.

The differences addressed by each transition include collating sequence, word size, bit usage and print file conventions, according to Dataware. Other considerations such as communications, data base, ECL/JCL and system utilities differences must be manually resolved and will vary according to the different operating environments, a spokesman added.

The output of the package aligns the original Univac with the IBM Cobol

code whenever syntax changes have occurred.

The conversion worksheet also provides diagnostics to the right side of the listing to assist the programmer in his post-review effort. The diagnostics issued flag the problem line of code with self-explanatory messages varying from warning-type situations to those reflecting a feature no longer available when going to the target environment.

The software (base program and specific syntax table) can be licensed for an annual fee of \$4,800, which includes documentation and maintenance. Dataware is located at 2565 Elmwood Ave., Buffalo, N.Y. 14217.

Report Generator Self-Prompts

WELLESLEY, Mass. — Warner-Eddison Associates, Inc. has announced Inmagic, a report-generating package that reportedly provides access to variable-length text records and operates with self-prompting commands.

The data management system performs subject searches using Boolean criteria by numerical, chronological and full-term or key-word indexing at various levels of detail. Printing output on cards, labels and other formats, Inmagic provides on-line record maintenance.

Inmagic runs on Digital Equipment Corp. PDP-11 computers under RT-11, RSTS/E, RSX-11M operating systems or VAX/VMS, as well as on the Hewlett-Packard Co. HP 1000. It is written in Fortran IV with a 100K-byte program size and 56K-byte main memory requirement.

Warner-Eddison said applications include business and technical document collections, engineering drawings and vendor catalogs.

Inmagic is priced starting at \$6,875 from the vendor at 186 Alewife Brook Parkway, Cambridge, Mass. 02138.

'Flipper' Backs HP's MTS/3000

COUNTRYSIDE, Ill. — Systech, Inc.'s CRT forms storage program, Flipper, now supports users of Hewlett-Packard Co.'s MTS/3000 system.

Previously supporting only asynchronous communications, Flipper is said to automatically store DEL or V/3000 form displays in the terminal's memory, providing immediate recall and display.

In addition to supporting the MTS/3000, the release also features an improved forms compression technique, whereby it optionally removes the oldest, least used form when memory fills and dynamically reallocates memory to handle exceptionally large forms.

Flipper costs \$3,000 from 6150 Joliet Road, Countryside, Ill. 60525.

CICS Performance Monitor Functions Under DOS/VS

MARINA DEL REY, Calif. — Candle Corp. has announced a CICS performance monitor that functions in an IBM DOS/VS environment.

The Omegamon/CICS package is a software monitor that operates on CICS/VS Release 1.4.1 and above. Features include monitoring of CICS lockouts, response time problems and system utilization, Candle said.

The package displays CICS performance information on a CRT screen.

It also offers exception analysis to diagnose problems with storage, VSM and enqueues. Degradation

analysis tells the user why specific transactions are being degraded, the vendor said.

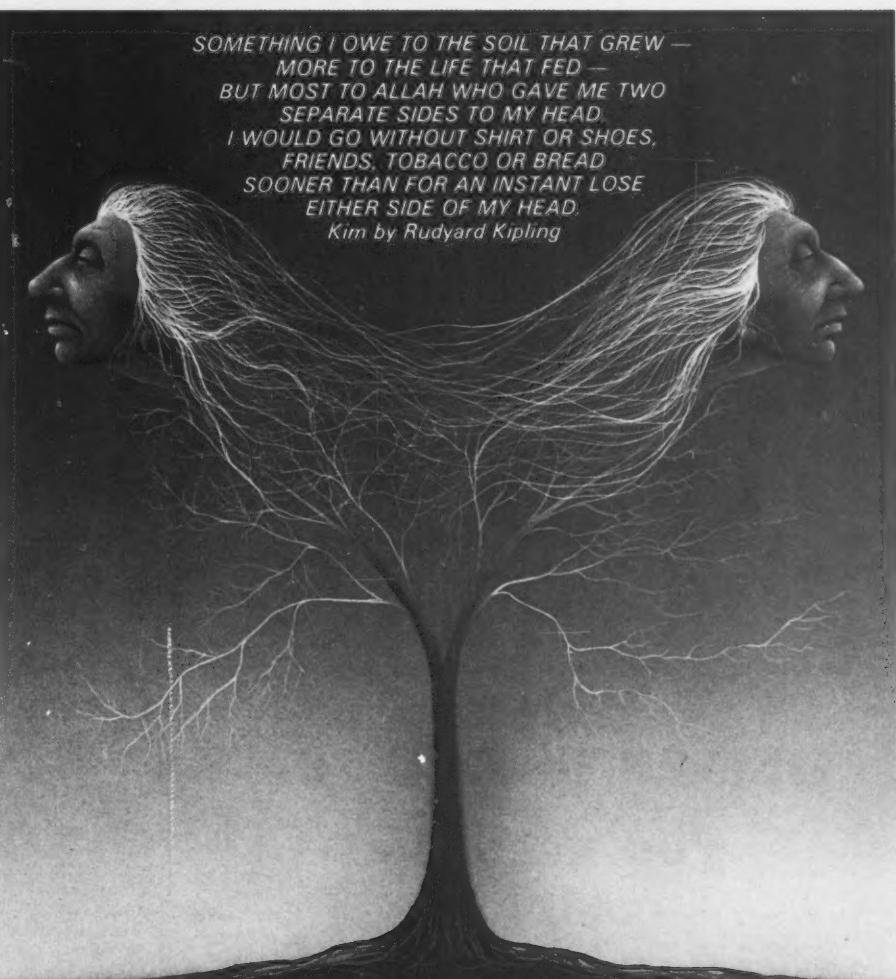
Omegamon/CICS can be installed in about 20 minutes without hooks or authorized libraries, a Candle spokesman claimed. The monitor can be used as a CICS transaction or on a dedicated 3270 terminal.

The monitor is available to CICS DOS/VS users for an introductory price of \$4,900; after the introductory offer, the price will be \$7,500.

A 30-day demonstration of the product costs \$100, the vendor said from Suite 624, 4676 Admiralty Way, Marina Del Rey, Calif. 90291.

*SOMETHING I OWE TO THE SOIL THAT GREW —
MORE TO THE LIFE THAT FED —
BUT MOST TO ALLAH WHO GAVE ME TWO
SEPARATE SIDES TO MY HEAD.
I WOULD GO WITHOUT SHIRT OR SHOES,
FRIENDS, TOBACCO OR BREAD
SOONER THAN FOR AN INSTANT LOSE
EITHER SIDE OF MY HEAD.*

Kim by Rudyard Kipling



WHAT KIPLING SAID WITH POETRY, SCIENCE IS PROVING WITH RESEARCH. THE BRAIN'S LEFT HALF FOR ANALYSIS, THE RIGHT HALF FOR CREATIVITY. IFPS, THE INTERACTIVE FINANCIAL PLANNING SYSTEM, SUPPORTS BOTH SIDES EQUALLY WELL. EXECUTIVES USE IFPS FOR SUPPORTING BOTH SIDES OF THEIR BRAINS. LET YOUR CREATIVITY FLOW AND GET INSTANT RESPONSES TO ALL IMAGINED SCENARIOS.

EXECUCOM

P.O. BOX 9758, DEPT. CW, AUSTIN, TX 78766, (512) 345-6560

Poster Reproduction of this Frank Howell painting available upon request.

MSA Group Formed

CLIFTON, N.J. — Non-IBM users of Management Science America (MSA) software have formed a users group. The first meeting was attended by five companies, a number that has subsequently grown to 10.

The purpose of the group is twofold: to make contact with other non-IBM MSA users and to exchange ideas and share experiences.

Anyone interested in more information should contact Sandy Montroy or Mary Ciulla at General Instrument Corp., 225 Allwood Road, Clifton, N.J. 07012.

'File Zero' Protocol Out

NASHUA, N.H. — A software protocol that reportedly permits data base entry, storage, manipulation and retrieval is available from the Functional Automation Division of Gould, Inc.

Designated File Zero, the protocol resides in all F-64 Cybloc computing and I/O processing modules and reportedly allows preparation and use of software programs

regardless of the type, mix or memory storage media.

With an identical message interface for all media, languages and users, it is said to simplify access to an expansion of the data base stored in a Cybloc network.

There is no charge for the protocol, which is part of the Cybloc system, the vendor said from 3 Graham Drive, Nashua, N.H. 03060.

Through Integrated Information System Wang Unveils WP for 2200 Series

LOWELL, Mass. — Wang Laboratories, Inc. has introduced word processing (WP) for its 2200 series of small business computers.

The WP functions, supported through a new Integrated Information System workstation, include document editing, creation, print, storage and filing capabilities, a spokesman said.

In addition, the 2200 series Integrated Information Systems have all 2200 telecommunications facilities and capabilities, including IBM 3270 emulation.

Price Quotes

The 2200 Word Processing software package is available for \$2,000. The 2236DW workstation costs \$3,500, and

upgrades of present 2235DE terminals are available for \$1,000.

Product availability is sched-

uled for March.

Wang is headquartered at One Industrial Ave., Lowell, Mass. 01851.

'IC-10' System Updated; Aimed at Semi Industry

SANTA CLARA, Calif. — Software Management Corp. has announced Release 3.0 of its IC-10 Integrated Circuit Manufacturing Information System featuring data base and hardware-independence and integration with a number of companion products.

Created for the semiconductor industry, the on-line management information system is said to provide control and visibility of the entire semiconductor manufacturing and production environment.

Release 3.0 is fully integrated with the firm's CA-10 Integrated Circuit Cost Account-

ing and Inventory Evaluation System and a number of planned future companion products, according to a spokesman.

A Hewlett-Packard Co. HP 3000-based version running under the Image data base costs \$95,000 for the first installation. A Digital Equipment Corp. VAX-11/780 version using DEC's Isam file system also costs \$95,000, and an IBM version under CICS/DB-1 costs \$99,500.

Software Management is located at Building 58, 3350 Scott Blvd., Santa Clara, Calif. 94025.

THINK BIG, THINK SMALL.

The capabilities built into our small computer will help OEMs build a much bigger market share. For complete information and pricing, call Ralph Marchetti, OEM Manager, at (408) 946-5000 or write us at 3003 North First Street, San Jose, CA 95134.



DURANGO

WE'RE OEM COMPATIBLE.

**Have a
DEC-20 or DEC-10?
You need the
complete
RELATIONAL DBMS.**

DPL

Send for more information now.

NATIONAL
INFORMATION
SYSTEMS, INC.



20370 TOWN CENTER LANE • 245
CUPERTINO, CA 95014
(408) 257-7700

Name _____
Company _____
Address _____

Phone _____ CPU _____

Xerox's 'XICS' Eliminates Composition Operations

EL SEGUNDO, Calif. — A software package designed to eliminate conventional composition operations in publishing has been unveiled by the Printing Systems Division of Xerox Corp.

XICS will be used in conjunction with the Xerox 9700 electronic printing systems and will also run with other CPUs, the vendor claimed. The package accepts text from any terminal or word processor and formats it into complete pages for printing on the

9700. The formatting includes all composition and page makeup, a spokesman said.

XICS consists of programs like edit and update, publication masterfile management and composition and pagination.

The one-time license fee for the product is \$30,000, plus \$250/month maintenance charge and a \$2,000 installation fee, the vendor said from 880 Apollo St., El Segundo, Calif. 90245.

Commodore Offers Free Disaster-Relief Program

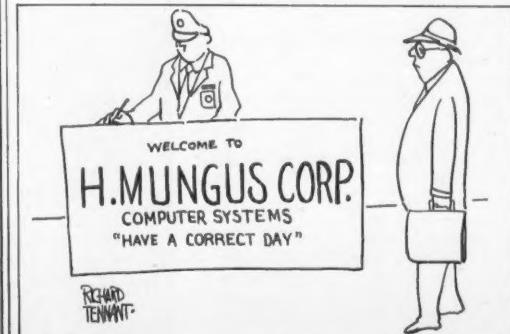
NORRISTOWN, Pa. — Commodore Business Machines, Inc. will release free of charge to its 500 dealers a disaster-relief software program first developed at the site of the MGM Grand Hotel fire during Comdex '80 in Las Vegas last fall [CW, Dec. 1].

The program keeps track of the names, addresses, hotel

room numbers and relocation sites of guests in the event of disaster.

Should a comparable emergency occur again, Commodore dealers will be able to aid local disaster-relief organizations, a spokesman said.

Commodore is located at 950 Rittenhouse Road, Norristown, Pa. 19403.



Four Programs for IBM 5280 Target First-Time Users

OMAHA, Neb. — MHA Software Services, Inc. has announced four packages — Accounts Receivable, Accounts Payable, General Ledger and Payroll — for the IBM 5280. Each program uses a full 24-in. by 80-in. interactive screen and is initiated through menus designed for the first-time computer user.

Accounts Receivable features either open item or balance forward accounting, with on-line inquiry available without the need to assign account numbers.

Accounts Payable also generates checks based on date due assigned when the invoice is first entered; hand-written checks may also be entered for listing on the month-end check register, a spokesman noted.

General Ledger

General Ledger shows a balance forward and all activity for the current month. It also includes a user-defined balance sheet and operating statement; Payroll features four hourly pay

types and eight deduction types, while updating tax routines at year-end for an annual fee.

The packages, available immediately, license for \$1,500 each. MHA Software Services is at 7117 Farnam St., Omaha, Neb. 68132.

'EDX Report Writer' Backed on Version 3 Of IBM's EDX

SAN FRANCISCO — The Event Driven Executive (EDX) Report Writer is now supported on Version 3 of IBM's EDX, Raymond G. Lorber, Inc. has announced.

The EDX Report Writer for Series/1 minicomputers can now support the index access method (IAM) supplied by Applied Real-Time Systems, Inc.

The suggested price is \$5,000, with multiple copy discounts available from Raymond G. Lorber, Suite 2840, 333 Market St., San Francisco, Calif. 94105.

From Info III System/34 Gets Job Utility

WOODLAND HILLS, Calif. — Info III has announced the Job Time Utility Program, said to allow IBM System/34 users to control the time when any job is to be run.

The utility can prevent a job from being run during any times inside or outside the limits specified, the vendor said.

The price is \$50, including diskette and mailing costs.

Info III is headquartered at 21250 Califa St., No. 107, Woodland Hills, Calif. 91367.

'Datascan' Fits System/34

ATLANTA — Data Management Systems, Inc. is offering Datascan, its data management system, for use on IBM System/34 computers. A similar product, ASK, is available for the NCR Corp. 8000 series.

Datascan can be used with any exist-

ing data bases without changes in current files, data structures or existing DP procedures, the vendor claimed.

The product costs \$6,250 for a one-time license fee, the vendor said from Suite 809, 4360 Georgetown Square, Atlanta, Ga. 30338.

Newsletter Aids System/34 Users

LUDLOW, Mass. — Computer Technologies, Inc. is offering free subscriptions to its newsletter devoted to software techniques for the IBM System/34.

The newsletter announces test tips and techniques, in addition to newly developed packages.

The firm may be reached through P.O. Box 259, Ludlow, Mass. 01056.

'FMS-80' Training Tapes Available

PALO ALTO, Calif. — Systems Plus, Inc. has developed video training tapes for DJR Associates, Inc.'s FMS-80 data base management system.

Available on VHS or Beta Max format, the tapes include a 90-minute reel and one of two hours. The first tape explains the fundamentals of FMS-80 and tells how to generate file definitions, screens, reports or user-defined menus.

The second tape discusses the features of FMS-80's report generator and internal programming language called Extended File Maintenance.

The set costs \$130 plus shipping charges from 3975 E. Bayshore Blvd., Palo Alto, Calif. 94303.

Enhancements Added to 'Cuffs'

NEW YORK — Cuffs Planning & Models, Ltd. has announced Release 5.05 of its Combs-Unangst Financial Forecasting System (Cuffs).

Enhancements to the modeling language include improved data entry, functions, report writing, goal seeking and multilevel consolidation features. Cuffs is also offering a seminar program for financial planners who want to know more about computerized fi-

nancial modeling.

The Cuffs update is available as part of the maintenance agreement for in-house users. It also has been distributed to time-sharing firms offering Cuffs.

The Cuffs package costs \$45,000 for in-house use. More information is available from the vendor at 201 E. 87th St., New York, N.Y. 10028.

How to count your chickens before they hatch.

Now available for
PDP-11 and VAX-11.

Surprises can be expensive. Even good news can cost money if your company is not prepared for it.

With financial modeling you can avoid surprises and plan calmly for whatever the future has in store.

FINAR is the latest financial analysis and reporting system. It will help you plan:

- | | |
|----------------------|----------------------|
| ■ Budgets | ■ Project evaluation |
| ■ Cash flow | ■ Forecasts |
| ■ Capital investment | ■ Consolidation |

All you need is a DEC PDP-11 with RSTS or a VAX-11, and FINAR—the Financial Analysis and Reporting Language.

If you'd like to know how to count your chickens before they hatch, call or write:

Finar Systems Limited
6000 E. Evans, Suite 2-300
Denver, CO 80222 • (303) 758-7581
New York • (212) 222-2784
Chicago • (312) 876-1081
Houston • (713) 960-0848
San Francisco • (415) 956-1178
Toronto • (416) 245-8473

FINAR



OEM America Meets

At The Invitational Computer Conferences

In Boston...in Ft. Lauderdale...in Palo Alto and seven other cities. OEM decision-makers meet the country's top computer and peripheral manufacturers at the Invitational Computer Conferences—the only seminar/displays designed specifically for the unique requirements of the quantity user.

In one day, at each 1980/81 ICC, guests will receive a concentrated, up-close view of the newest equipment and technology shaping our industry. Some of the companies which participated in the 1979/80 ICC Series were: ADDS; AVIV Corp.; Applied Data Communications; BASF Systems; Cambridge Memories, Inc.; Centronics; Century Data Systems; Cipher Data Products; Compugraphic; Computer Devices; Control Data Corp.; Data Systems Design; Data-products Corp.; Dataram; Datatech Corp.; Diablo Systems; Documentation; Emulex Corp.; Facit Data Products; Florida Data; Hewlett-Packard; International Memories, Inc.; Kennedy Company; Lear Siegler; MDB Systems; MFE Corp.; Microdata; Monolithic Systems; Mostek; NEC Information Systems; National Semiconductor; Olivetti; Perkin-Elmer Memory Products; PerSci, Inc.; PCC/Pertec; Pioneer Magnetics; Plessey Peripherals; Powertec; Priam; Printtronix; Remex; Rianda Electronics; Scientific Micro Systems; Shugart Associates; Siemens; Storage Technology; TEC; Tally Corp.;

Teletype; Telex Computer Products; Texas Instruments; Trilog; Universal Data Systems; Versatec; Xylogics.

The schedule for the 1980/81 Series is:

Sept. 8, 1980	Newton, MA
Sept. 30, 1980	Valley Forge, PA
Oct. 22, 1980	St. Louis, MO
Nov. 18, 1980	Palo Alto, CA
Jan. 13, 1981	Orange County, CA
Feb. 3, 1981	Ft. Lauderdale, FL
Feb. 5, 1981	Atlanta, GA
Mar. 3, 1981	Dallas, TX
Mar. 5, 1981	Houston, TX
Apr. 2, 1981	Denver, CO



Invitational
Computer
Conferences

Invitations are available from participating companies or the ICC Sponsor. For further information contact: B.J. Johnson & Associates, Inc., 2503 Eastbluff Drive, No. 203 Newport Beach, CA 92660 (714) 644-6037

'Reportwright' Tailors Custom Reports

COSTA MESA, Calif. — California Systems Associates has unveiled Reportwright, a package that reportedly allows creation of specialized reports tailored to user requirements.

The package is designed for middle and upper-level managers and other nonprogrammers, a company spokesman said.

Reportwright is designed for use on Digital Equipment

Corp. RT-11, TSX and TSX-Plus equipment and can draw information from a variety of data bases, including Mini-Computer Business Applications, Inc. (MCBA) software packages, the spokesman said.

The price of Reportwright is \$500.

California Systems Associates is at Suite 4, 2845 Mesa Drive E., Costa Mesa, Calif. 92626.

DBL Available for RSX-11M

CARMICHAEL, Calif. — The Digital Information Systems Corp.'s DBL language is now available for use under the Digital Equipment Corp. RSX-11M operating system. DBL reportedly makes available to RSX users the library of DEC's Dibol business application packages available under both CTS-300 and 500.

Included with the DBL compiler and run-time system are a debugging facility, Isam file creation and status utilities

and a utility to load and unload Isam files, a company spokesman reported.

The price of the package is \$4,200 with quantity dis-

counts available.

Digital Information Systems Corp. is at 6247 Fair Oaks Blvd., Carmichael, Calif. 95608.

Plessey Packages Handle Cobol, Dibol on LSI-11/23

IRVINE, Calif. — Plessey Peripheral Systems, Inc. has unveiled two commercial software packages designed to ac-

commodate Cobol and Dibol on the vendor's Syst-13V or Digital Equipment Corp.'s LSI-11/23 systems.

PCS-100 and PCS-200 also feature TSX-Plus, a multiminal operating system especially suited for business DP. TSX-Plus also provides time-sharing capabilities.

PCS-200 TSX-Plus with Cobol-Plus, supplied on a top-loading cartridge disk, carries a one-time price of \$3,358, the vendor said from 1691 Brown-ing Ave., Irvine, Calif. 92714.

Service Bureau Co. Adds Program

GREENWICH, Conn. — The Service Bureau Co. has added a Purchase Order Matching and Control System to its existing accounts payable service.

The system allows the user to compare invoices automatically with open purchase orders. It can also be used to maintain closer control over receipt of goods and past-due shipments, the vendor said.

The program is a batch-oriented program and is billed on an as-used basis, the vendor said from 500 W. Putnam Ave., Greenwich, Conn. 06830.

Dow Jones News Updates Service

NEW YORK — Dow Jones & Co., Inc. is offering Money Market Services' Weekly Economic Survey data base with the computerized Dow Jones News/Retrieval Service.

The Retrieval Service will now feature economists' forecasts of changes in indicators such as the weekly money supply, federal funds rate, unemployment rate, consumer price index and gross national product, the company said.

Access to the economic survey is priced at \$40/mo and \$2/min from Dow Jones & Co., Inc., 22 Cortland St., New York, N.Y. 10007.

MERGER

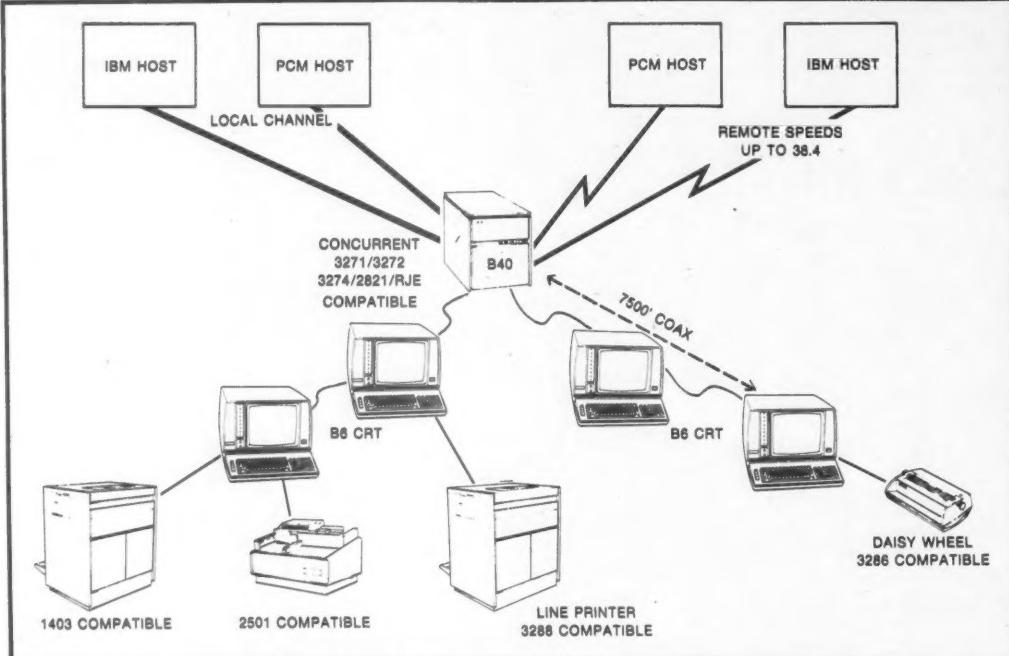
Applications software company with national product line seeks partner with national distribution/service organization. Write:

**CW Box 2479
375 Cochituate Rd.,
Rte. 30
Framingham, Ma. 01701**

3270 USERS



BRAEGEN = COMPATIBILITY PLUS



GET THESE IMPORTANT BENEFITS

- MULTIPLE HOST ATTACHMENTS.** A single B40 controller can attach to several IBM 360/370's or IBM compatible CPU's. Mix Local and Remote attachments. Reduced number of controllers.
- SWITCHABLE CRT's.** Each B6 operator can switch between available host attachments (again, mix locals and remotes). Switch between different IBM addresses on the same 360/370. Often, one Braegen B6 CRT can replace several 3270's.
- SHARE CABLES.** Braegen CRT's (and printers, too) can share the same coax. You don't need a separate expensive coax cable for each B6 CRT. Just daisy chain new B6 CRT's to existing coax.
- LONG CABLES.** CRT's (printers, too) can be up to 7500 feet from the B40. Often, this lets you use local 3270's instead of remotes. Saves 370 software size, polling and you get faster response. Sometimes, this even saves you a separate controller.
- BETTER I/O.** A wider range of speeds, and better print quality than you'll find elsewhere for 3286/3288 compatible printers. 1403 compatible printers and 2501 compatible card readers can be located up to 7500 feet outside the computer room thus eliminating all the special TP gear you have with RJE.

PLUS ... Low cost and fast delivery.

Customers throughout the U.S. are receiving these benefits today. For more information please contact The BRAEGEN Corporation, 20740 Valley Green Drive, Cupertino, California 95014. (408) 255-4200



BRAEGEN

System Offers Interactive Testing

ALEXANDRIA, Va. — An interactive test system for data communications protocol diagnostics has been introduced by Atlantic Research Corp.

The Interviewer 4500 is said to offer features designed for packet protocols and IBM's Systems Network Architecture (SNA), as well as detailed analysis of High-Level and Synchronous Data Link Control. Bisynchronous, asynchronous and Ascii, Pars, EBCD, XS-3, Selectric and Ebcidic are standard in the unit.

The diagnostics of the 4500 use a self-teaching simultaneous trigger technique, allowing up to eight independent triggers to be active at the same time.

The Interview 4500 costs \$14,500. A conversion kit to change an existing Interview 3500 to a 4500 costs \$5,000 from the firm at 5390 Cherokee Ave., Alexandria, Va. 22314.

Remote Controllers SNA-Compatible

NASHVILLE, Tenn. — Northern Telecom Inc.'s Electronic Office Systems has brought out a family of on-line data display systems compatible with IBM's Systems Network Architecture (SNA).

The family consists of the Model 296C, a small-cluster remote controller comparable to the IBM 3276, and the Model 294C, a large-cluster remote controller comparable to the IBM 3274-1C, according to a Northern Telecom spokesman. The Model 296C reportedly can control up to eight display stations and Sprinter bidirectional printers, the 294C up to 32 display stations and printers.

All peripherals can operate at distances up to 5,000 ft from the controller.

The SNA command functions will enable users to perform system control operations from remote terminals, the spokesman noted. For example, an authorized operator in a remote office can assign or reassign another display or printer and activate or deactivate a controller in the network.

The two terminals come with a choice of three screen capacities: 1,920, 2,560 or 3,440 total characters, using 80-char. lines. Each of these screens includes an extra status line which provides the operator with system information.

The Model 294C can also control Model

(Continued on Page 74)

Land Developer Selling Common-Carrier Services

By Brad Schultz
CW Staff

HOUSTON — Just as water adds value to land, so does data communications, and that is why a Texas land developer has entered the specialized common-carrier business in a move that speakers here at the recent Communication Networks (Comnet '81) conference described as part of a trend.

Land developers selling communication services? Times are hard for companies that sell land for construction of office buildings, shopping malls and homes, so the Las Colinas Association of Irving, Texas, is stringing two 54-channel coaxial cables to each residence on half its 12,000-acre development near Dallas.

Bypassing phone company resources and available only to Las Colinas tenants, the facilities are driven by a Hewlett-Packard Co. 1000 minicomputer, Data General Corp. Micronova, Digital Equipment Corp. PDP-8 and several Apple Computer, Inc. Apple II, Radio Shack TRS-80 and Zilog, Inc. MCZ microcomputers.

Services include a range of viewdata-type offerings — home and office access to consumer and commercial data bases — as well as news wire services, security offerings such as links between alarms on tenant premises and the local police and fire departments and a host of entertainment programs.

According to David L. Leininger, Las Colinas vice-president and general manager, these services will be a source of revenue and help draw builders and buyers of property during the present slump in the real estate and construction industries caused by soaring mortgage and loan rates.

Expensive Properties

Other land developers may be planning such an approach to stagflation fighting, he told the conference session, although the Las Colinas master plan specifies development of "very high-end" properties — too expensive for most people to acquire.

The four-trunk Las Colinas Association Communications Systems (LCACS) will eventually be a hierarchical, local distribution network facility, Leininger said. LCACS will interface Ethernet-type local net systems, distributed data bases maintained by Las Colinas, public packet-switched networks and private corporate networks.

Las Colinas does not plan to construct internal networks for corporate tenants, which now include several high-technology firms and branch offices, including a 1,200-employee IBM support center. Instead, LCACS will be the "backbone" of data communications facilities established by these businesses.

To date, Las Colinas has spent about \$35,000 per mile for the basic LCACS plant and another \$20,000 per mile for the trunks that will soon distribute plant services at 400MHz.

Las Colinas decided to lay out its own system rather than obtain a system from Bell because Bell did not offer adequate error rates and line speeds, Leininger noted. Also, the land developer wished to eschew affiliation with the various coaxial cable companies because their reputation and marketing objectives appeared to conflict with the Texas firm's own objectives, he added.

Among issues and problems yet to be re-

(Continued on Page 74)

Terminals Linked To 32-Bit Megamini

OCEANPORT, N.J. — The Computer Systems Division of Perkin-Elmer Corp. has introduced a data communications adapter for use on its Megamini line of 32-bit minicomputers.

The Current Loop Communications Multiplexer (CLCM) is said to provide an economical solution to attaching terminals to a Perkin-Elmer computer system. CLCM allows terminals to be located up to 5,000 ft from the computer system.

The product provides eight asynchronous communications lines with a current loop interface. Each individually programmable line interfaces to the multiplexer bus of any Perkin-Elmer 32-bit processor and reportedly provides full duplex operation with the connected terminals.

Sixteen transmission rates from 50- to 19.2K bit/sec are available, with selected groups of up to four transmission rates programmable at one time. The unit can transmit data at 4,800 bit/sec at 5,000 ft, with higher rates available over shorter distances.

The CLCM costs \$2,200 from the Computer Systems Division, Two Crescent Place, Oceanport, N.J. 07757.

modems

SERIES 302

Bell 103 and 113A Replacement
300 Baud Full Duplex

Features Provided:

- Originate, answer and switchable modes
- EIA and Current Interface
- Carrier Indicator
- Half/Full Duplex Switch

\$197

Modem
Stand-alone



SERIES 212A

Bell 212A Replacement
1200/300 Baud Full Duplex
Direct Connect - No DAA

Each Modem Provides:

- Automatic answer
- Manual Originate
- 8 Status Indicators
- Analog Loopback
- Digital Loopback
- 300 or 1200 Baud

\$837

Modem
Stand-alone



STAND ALONE

RACK MOUNT

SERIES 330

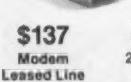
Bell 103, 113, 201, 202 Replacement
Mix 300, 1200 and 2400 Baud
Direct Connect - No DAA

Automatic Answer
Leased Line



\$237

Modem
Auto Ans.



\$137

Modem
Leased Line

\$147

2 Modem
Unit

Each Modem Provides:

- Integral Power Supply
- Display of 6 Functions
- Busy Out
- Loopback



\$297

8 Modem
Unit

modems



\$497

16 Modem
Unit



Please check items of interest and return to us for additional information

8115 Monticello
Skokie, IL 60076
312/677-3900

New York
212/267-3696

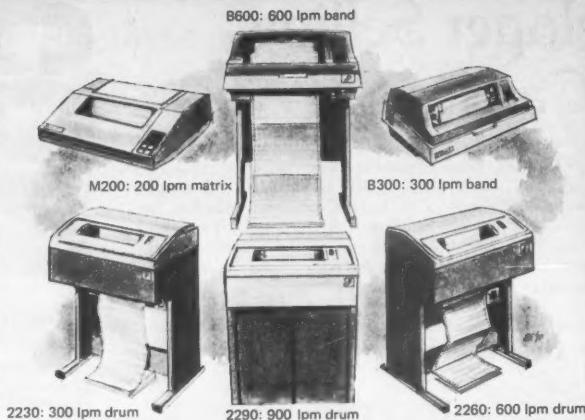
Los Angeles
213/624-0550

member of

IDCMA

name _____
company _____
street _____
city _____ state _____ zip _____
telephone _____ ext. _____

ComDATA
We can get you there from here.



MTI line printing systems can save you thousands of dollars and months of waiting.

MTI's Dataproducts line printers are probably the identical printers your mainframe vendor sells under his name. MTI's interfaces are as compatible and software transparent as the vendor's. So why pay thousands of dollars extra for his name? And MTI is an authorized stocking distributor of Dataproducts line printers, so we can usually deliver your line printer system immediately. MTI plug-compatible printer controllers are available for all the popular minicomputers. We also specialize in remote line printer systems. So now you can save time and money. Call MTI today: 516/482-3500, 212/895-7177. Outside N.Y.S.: 800/645-8016 and in Ohio: 216/464-6688.



Applications Specialists & Distributors, Great Neck, N.Y. and Cleveland.
DEC, Texas Instruments, Lear Siegler, Dataproducts, VME, Hazeline, Teletype, Technidyne, Omnitel, Radix, Videotex, Anderson Electronics, General DataComm, Control Data, Intel, Ciphex, Prism, SMB, Western Peripherals, Able Computer, Egar and Franklin Electric.

American for TERMINALS

Teletype



43
\$995

OUR 10+ UNIT CASH PRICE

PLUS: DEC, Hewlett Packard, Lear Siegler, Qume, IBM and General Electric.

**CALL BUY: 617-437-1100
TODAY LEASE: 617-437-7600**

AMERICAN COMPUTER GROUP, INC.
P.O. Box 68, Kenmore Station, Boston, MA 02215

Datatrol RS7000 Designed For Customized Solutions

HUDSON, Mass. — The newly introduced Datatrol, Inc. RS7000 is the first in a series of systems electronic cash registers designed to provide customized solutions for retail data collection problems in large specialty store chains.

The RS7000 is a multifunctioned point-of-sale (POS) data collection terminal, which can operate either stand-alone or in a clustered configuration.

Retail management can be provided with up-to-date information, such as traditional cash receipts usually associated with an electronic cash register, as well as noncustomer transaction data.

As a stand-alone unit, the terminal requires no external controller and allows data preprocessing without a mainframe computer. In a clustered configuration, an unlimited number of



The Datatrol, Inc. RS7000

external devices can attach to the network to provide expanded terminal intelligence and systems capabilities.

Cost of the RS7000 ranges from \$3,500 to \$7,000, depending on user-selected terminal configurations and options. Datatrol is located at Kane Industrial Drive, Hudson, Mass. 01749.

Developer Sells Services

(Continued from Page 73) solved for LCACS is how to ensure acceptable reliability. "Attention must be given to alternate path network routing in the event of plant outages so that signal can be continued beyond the point of the outage and the outage can be isolated," Leininger said.

Another problem is deciding who will own and be legally liable for what in the LCACS network, since much equipment will be installed and maintained on tenant premises.

Further, Las Colinas has yet to resolve the problem of finding an appropriate data communications network architecture. "There are very few firms and individuals capable of undertaking the overall development of a broadly defined mixed use broadband coaxial network capable of handling video, audio and data," Leininger observed.

The Las Colinas general manager projected that hardware and software necessary to support a fully operational broadband communication network will not be available in quantity until late 1983 or 1984. Moreover, the software underpinnings for the planned Viewdata-type data base ser-

vices will be in limited supply until late 1982 or 1983.

Leininger charged that cable companies are not prepared to merchandise and support interactive services in the near future because their personnel lack necessary technical expertise, their marketing departments have yet to determine how to package interactive services for end users and salesmen and support personnel "have virtually no experience in actual sale and support of these services."

Leininger also asserted that the two-way coaxial cabling necessary for interactive processing will not be available in quantity until the 1984-1985 time frame.

LCACS services to residences will typically start at \$48 per month and range up to another \$100 per month for the word processing services demanded by businesses, Leininger estimated.

Pilot projects in such services have demonstrated that some affluent households will buy the full gamut of services, which include a number of video entertainment and games offerings, no matter what they cost, he told the session.

SNA-Compatible CRTs Out

(Continued from Page 73) 297 displays, which were offered with Northern Telecom's older Model 296 and 291 on-line systems.

The Sprinter printers, with speeds of 72-, 144- and 18-char./sec., can perform all SNA character string print functions, the spokesman said.

The purchase price of a typical Model 296C configuration, including four 1,920-char. display stations and a 144 char./sec. Sprinter, is \$18,000. Comparable monthly lease rates for one-, two- and three-year contracts are \$532, \$441 and \$413, respectively, including maintenance. First customer shipments will begin this month.

A typical Model 294C configuration, with eight 1,920-char. display stations and a 144 char./sec. Sprinter, has a purchase price of \$33,410. Its comparable monthly lease rates are \$992,

\$808 and \$755, including maintenance. First customer shipments of these controllers will begin in February.

Northern Telecom Electronic Office Systems division is at International Plaza, Nashville, Tenn. 37217.

Cobar Cuts Price 10% On CRT Terminals

ANAHEIM, Calif. — Cobar, Inc. has announced a 10% price reduction on its Model 3132 CRT terminal, which emulates the Digital Equipment Corp. VT100 and VT132.

The new price is \$1,795 for single terminal orders, with additional volume discounts, a company spokesman said.

Additional information is available from Cobar at 1181 Fountain Way, Anaheim, Calif. 92086.

Intertel Micro-Based Multiplexer Bows

ANDOVER, Mass. — Intertel has unveiled a microprocessor-based statistical multiplexer that, combined with

the firm's high-speed modems, reportedly replaces asynchronous low-speed data lines and modems with a single

Formerly Special-Order Modems Now Standard From Racal-Milgo

MIAMI — A modem series previously available on special order only will now be offered as a standard product by Racal-Milgo, Inc.

The microprocessor series MPS 9601, 7201 and 4801 high-speed modems with RS-232C-type interfaces will now be offered with RS-449 interfaces as a standard product.

These modems will continue to be offered in standard form with RS-232C-type interfaces, which have 25-pin connectors and a modem-to-terminal distance of 50 ft. The newly standardized RS-449 interfaces, which are

available with single-port or multiport modems, have 37-pin connectors and a modem-to-terminal distance of more than 2,000 ft.

The RS-449 interface will be priced approximately 5% higher than those with the RS-232C-type interface. As an example, the 9601 multiport with RS-232C costs \$7,200 and the comparable RS-449 costs \$7,500.

Racal-Milgo is located at 8600 N.W. 41st St., Miami, Fla. 33166.

high-speed line and an associated modem pair.

The SMX8000 features firmware that ensures it will remain transparent to each asynchronous line user while providing use of the high-speed line, the vendor claimed.

Available in 4- or 8-channel versions, the product concentrates up to 8 asynchronous lines into a single, high-speed asynchronous data stream, a spokesman said. It can also multiplex data from a group of asynchronous devices having an aggregate data speed of two, three or four times the rate of the high-speed data channel, he said.

An 8-channel stand-alone model costs \$2,675 and a similar rack-mounted version costs \$2,475, the vendor said from 6 Shattuck Road, Andover, Mass. 01810.

Envax 500 Gets Link to Infocom

IRVING, Texas — Vardon & Associates, Inc. has added an enhancement to the Envax 500 Series, making the devices compatible with Western Union's Infocom Service.

The Envax 500 is a data storage device that can communicate over the Telex or TWX and DDD networks, in addition to Infocom. Standard configuration is 16K bytes of random-access memory, which allows incoming messages to be stored while outgoing messages are being prepared. Other features are keyboard dialing, automatic retries and delayed transmission.

It interfaces with any RS-232 terminal and is compatible with all classes of Infocom service. The price will be increased somewhat for certain configurations, the vendor said from 1401 Walnut Hill Lane, Irving, Texa. 75062.

BDS-1 Converter Compresses Data

ESCONDIDO, Calif. — DEI Teleproducts is offering a data compression option with its BDS-1 asynchronous-to-synchronous converter.

The Data Compression Option enables word processing equipment utilizing 9-bit information fields to interface with statistical and time-division multiplexers that can handle only 8-bit information fields.

In the data compression mode, the unit acts like an Ascii to Ascii converter, accepting the 9-bit field and start and stop bits from the terminal, compressing the field to eight bits and transmitting the 8-bit character to the channel module of the multiplexer. At the opposite end, the process is reversed and the reconstructed character is transmitted to the associated terminal equipment.

In the asynchronous to synchronous mode, the BDS-1 accepts asynchronous data from the terminal and transmits it to its associated high-speed synchronous modem utilizing the modem's clock. At the remote end, the process is reversed.

The BDS-1 costs \$295 from the vendor at 2128 Vineyard Ave., Escondido, Calif. 92025.

New York To Host Meet

CAMBRIDGE, Mass. — The second annual symposium on "Integrating Business Machines into Local and Intercity Networks," sponsored by The Yankee Group, is slated for April 14-15 in New York.

The seminar will analyze the dynamics of the marketplace and the competitive strategies of the leading companies, delineate specific product and service opportunities and examine current and future user needs.

The seminar costs \$725 with \$100 reductions for additional registrants from the same company. It will be held at the Harvard Club in New York and more information is available from The Yankee Group, P.O. Box 43, Harvard Sq., Cambridge, Mass. 02138.

Go With McGraw-Hill's Experience!

Join The Computer Professionals' Book Club

Take any 3 books for only
\$1.00 each

(values to \$73.00)

If you join now for a trial period and agree to purchase four more books—at handsome discounts—over the next two years.

(Publishers' prices shown)



DOCUMENTATION STANDARDS AND PROCEDURES FOR ON-LINE SYSTEMS

By M. L. Rubin
582079-7 \$23.50

COMPUTER DICTIONARY AND HANDBOOK, 3/e

By C. J. & R. J. Sippl
582079-X \$29.95

ELECTRONICS DICTIONARY, 4/e

By J. Markus
404-313 \$24.50

MICROCOMPUTER INTERFACING

By B. Artwick
789/436 \$21.95

SOFTWARE DEBUGGING FOR MICROCOMPUTERS

By R. Bruce
582075-7 \$18.95

INFORMATION RETRIEVAL SYSTEMS: Characteristics, Testing, and Evaluation, 2/e

By F. W. Lancaster
582000-5 \$22.95

PROGRAMMING THE Z80

By R. Zaks
582049-8 \$14.95

THE DISTRIBUTED SYSTEM ENVIRONMENT

By G. M. Booth
065/071 \$21.95

DATA BASE COMPUTERS

By O. H. Bray & H. A. Freeman
582042-0 \$19.95

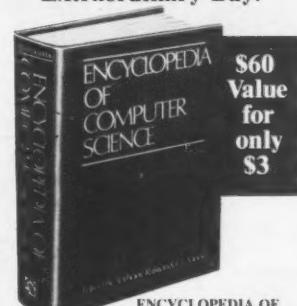
16-BIT MICROPROCESSOR ARCHITECTURE

By T. Dollhoff
582003-X \$24.95

MINICOMPUTER SYSTEMS, 2/e

By R. H. Eckhouse, Jr.
787/026 \$21.95

Extraordinary Buy!



\$60
Value
for
only
\$3

ENCYCLOPEDIA OF COMPUTER SCIENCE
By A. Ralston & C. L. Meek
769/01X (Counts as 3 of your 3 books) \$60.00

DATA BASE DESIGN
By G. Wiederhold
701/30X (Counts as 2 of your 3 books) \$25.95

CONVENIENCE — 14 times a year you receive the Club Bulletin. Full information on the Main Selection and alternate selections, together with a reply card. If you want the Main Selection, you simply do nothing—it will be shipped automatically. If you want an alternate selection—or no book at all—you simply indicate it on the regular reply card and return it by the date specified. You will have at least 10 days to decide. If, because of late mail delivery of the Bulletin, you should receive a book you do not want, just return it at the Club's expense.

As a Club member, you agree only to the purchase of four more books over a two-year period.

Please enroll me as a member and send me either the ENCYCLOPEDIA OF COMPUTER SCIENCE, billing me only \$3.00, or any three other books, billing me only \$1.00 each, plus local tax, postage, and handling. If unsatisfied, I may return any book within 10 days and my membership will be canceled. I agree to purchase a minimum of four additional books during the next two years as outlined under the Club plan described in this ad. Membership in the Club is continuous but cancellable by me any time after the four-book purchase requirement has been fulfilled.

Check here if you want ENCYCLOPEDIA OF COMPUTER SCIENCE (769/01X).

Check here if you prefer three other volumes, and indicate below by number the books you want. A few expensive books (noted in the descriptions) count as more than one choice.

--	--

Orders from outside the U.S. must be prepaid with international money orders in U.S. dollars.

Name _____

Address _____

City / State / Zip _____

Company _____
This order subject to acceptance by McGraw-Hill. All prices subject to change without notice. Offer good only to new members. A postage and handling charge is added to all shipments. P39306

Teleprinter Corp. Adds Telexes, Teleprinters

BERKELEY HEIGHTS, N.J. — Teleprinter Corp. of America has added a series of electronic telex and private-wire teleprinters to its existing line of equipment and printer services.

The electronic printers cut message time in half and sustain off-line speed of 30 char./sec., the firm claimed. They feature a Selectric-type keyboard and have the ability to receive and prepare messages.

The teleprinters, which can be customized to fit user needs, can be adapted to TWX, DDD, private-wire or computer peripheral applications.

The units range in price from \$3,200 to \$6,200 from the firm at 550 Springfield Ave., Berkeley Heights, N.J. 07922.

Smart Clock

The Leader in Stand Alone Data Collection Terminals



Data Collection For . . .

- PAYROLL • INVENTORY
- JOB COSTING • SECURITY ACCESS
- AND OTHER CUSTOM APPLICATIONS

 coastal data products inc.

7370 NW 36 Avenue/Miami, Florida 33147
(305) 696-6800

AVAILABLE NOW FROM FEDERAL . . .

TELETYPE® MODEL 4540 SYNCHRONOUS DATA TERMINALS



- 3270 software compatible
- Operation in ASCII or EBCDIC
- Clustering capability for up to 32 devices
- Up to 9600 bps
- Whole character, line at a time, impact printing
- Quick installation, easy to use
- Built-in diagnostics
- Modular construction
- Attractive styling

Phone 214/620-0644 today or write:

FEDERAL Communications
Corporation

11126 Shady Trail, Suite 101, Dallas, Texas 75229
214/620-0644 TELEX 732211 TWX 910-860-5529

Typewriter-Style Layout

Membrane-Keyboard Units Debut

GRANDVIEW, Mo. — A compact keyboard display terminal unit that contains 53 membrane keys in a typewriter-style layout is available from Computerwise, Inc.

The Transterm 1 utilizes a 64-char. 5-in. by 7-in. dot ma-

trix liquid crystal display organized in two 32-char. lines with an underscore cursor. The displayable character set is the standard 96-char. ASCII complement.

The unit communicates in full-duplex RS-232 serial asynchronous ASCII with

20mA current loop or RS-422 available as options. Switch-selectable transmission rates of 300-, 1,200-, 2,400- and 9,600 bit/sec. are included.

The price of the unit is \$449, the vendor said from 4006 E. 137th Terrace, Grandview, Mo. 64030.

Store Manager Handles Cash Registers, Inventory

SUNNYVALE, Calif. — Store Manager, a turnkey cash register data collection and inventory control system, has been introduced by Lazor Systems, Inc.

Transactions entered at one or more programmable cash registers are recorded in the system's master file to produce updated detailed or summary reports of inventory status, items to be reordered, cost and pricing data, returns, sales to date for the year or any specified period, high-and low-activity items, inventory turn, departmental summaries and other retail management information.

In addition to printed reports, the system can display answers to specific queries about time status, pricing and other necessary information.

The system includes up to 15

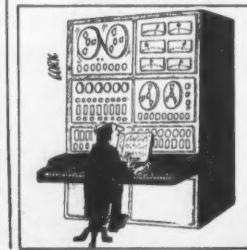
Link Analyzer Displays Errors, Measurements

ALTAMONTE SPRINGS, Fla. — A data link analyzer said to simultaneously display 12 line measurements and test parameters has been unveiled by Epicom, Inc.

The Epiker Model 301 reportedly detects and displays bit errors, block errors, block count, RTS/CTS delay, loop delay, percent peak distortion, Telco db, sync loss, percent present distortion, transmit clock rate, receive clock rate and dc voltage.

The unit is applicable on voice-grade data circuits, digital and microwave links, modems, multiplexers and other data communications equipment, a spokesman said.

Rack-mountable and portable, the unit costs \$3,900 from the firm at 592 N. Douglas Ave., Altamonte Springs, Fla. 32701.



Teletype 43s Get Buffer

PORTLAND, Ore. — Edge Technology has announced a buffered telex enhancement for Teletype Corp. Model 43 terminals.

The Telexbuffer-43 provides internal buffer and off-line editing capabilities. It features automatic dialing and uses electrically alterable read-only memory (EAROM), the vendor said.

Telexbuffer-43 is available with memory sizes from 2,048 to 16,348 characters and is priced from \$520, the vendor said from 2735 S.E. Raymond, Portland, Ore. 97202.

CICS USERS

You probably have occasional (or frequent) problems with CICS and you probably have to deal with them under the gun. If so, why not trade that undesirable situation for peace of mind with

CICS HOTLINE™

This hotline will solve your CICS crises, dilemmas, bugaboos, snags, gaps, snafus, and so forth. With over a decade of successful CICS experience, we know we can back up that claim. Whether you have top CICS expertise on site or none, we can make life smoother for you. To find out how, send your business card, letterhead, or name, title, organization name and address to:

CICS HOTLINE
Suite 1004, 163 Joralemon St. • Brooklyn, N.Y. 11201

If you need
to know,
you need to
subscribe

To subscribe, you can use your American Express, Visa or Mastercharge card and call toll free, 800-343-6474
(in Massachusetts, call 617-879-0700).

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

AJ Announces Terminal Option, Desktop Teleprinter, Price Cut

SAN JOSE, Calif. — A desktop teleprinter terminal designed for business communications and general-purpose DP applications has been announced by Anderson Jacobson, Inc. (AJ).

The company also announced an IBM 2741-compatible communications option for the Model 510 CRT terminal and a price cut on the AJ 1234 coupler.

The AJ 880 printer terminal features print speeds selectable from 10- to 30 char./sec., RS-232C communications interface and transmission rates from 110- to 300 bit/sec.

Operating in either Bell 103 full-duplex or full-duplex with local echo mode, the Digital Equipment Corp.-compatible teleprinter leases for \$70/yr or sells for \$1,295.

AJ 510 Option

In addition to the editing and communications capabilities of a standard Ascii CRT terminal, the AJ 510 with IBM 2741 compatibility offers full graphics and APL character sets with switch-selectable communications in Ascii, or

Interface Links Kodak IMT To 3270 Terminals

ROCHESTER, N.Y. — Eastman Kodak Co. has announced an interface that allows Kodak IMT microimage terminals to receive microimage retrieval commands from IBM 3270 terminals.

The Kodak Model 78 is reportedly compatible with IBM's SDLC protocol and IBM's 3274 control unit, the 3276 control unit/display station and the 3278 display station. The interface costs \$2,510 from 343 State St., Rochester, N.Y. 14650.

IBM 2741-compatible EBCD or correspondence transmission modes, the vendor claimed.

The basic terminal costs \$1,995 and the communications option, \$520. The two are available on a 12-month lease for \$110/mo, the vendor said.

The company also announced it has cut by 10% to

15% the price of the AJ 1234, a 1,200 bit/sec acoustic coupler compatible with the AJ 1256 and the Vadic Corp. VA 3400 series modems.

The AJ 1234 now costs \$795; for quantity orders, the reduction ranges from 10% to 15% over current list prices, a spokesman noted from the firm at 521 Charcot Ave., San Jose, Calif. 95131.

Voice/Data Mux Offered

FORT WASHINGTON, Pa. — A voice/data multiplexer that allows transmission of voice, data or simultaneous voice and data in systems of two to 24 channels has been introduced by Aydin Monitor Systems, Inc.

The Model 6223/6224 System Tailored Voice/Data Multiplexer is applicable in digital satellite communications systems. The 6223 and 6224 differ only in frame-/overhead structure, a spokesman said.

The unit features the use of only the bandwidth required to accommodate the voice or data traffic for which the multiplexer is configured.

Prices for the units range from \$8,385 to \$12,815 from the firm at 502 Office Center Drive, Fort Washington, Pa. 19034.

Now you can watch your four favorite programs...

The new HP 2626 display station will give you a view of your computer system you've never seen before.

It lets you divide the screen into as many as four separate "frames," each attached to a different workspace in the terminal's memory. You can check a program listing in one frame and access a file in another. Fill out a form in one workspace while the computer loads the next form into another. Or do text preparation and editing in adjacent frames.

What's more, you can set line lengths of up to 160 characters in any workspace. Then scroll horizontally to get the entire picture. (The built-in thermal printer includes a compressed mode that prints up to 132 characters per line.) Scroll vertically, too, or change the size of the frame at the touch of a key.

Split decisions.

The HP 2626 has two data communications ports instead of one, so you can hook up the terminal to two computers at the same time (or to the same one twice). Then, it's like getting a multi-tasking capability right in the terminal—your systems designer can compile, execute, monitor and edit programs as if two stations were available.

...same time, same station.

And while your user is filling out a form, the terminal can be sending data from the previous form to a computer. And down-loading the next form into an adjacent workspace. By smoothing out the "type and wait" of data entry, you can take advantage of less expensive, low-speed transmission lines without sacrificing the efficiency of your operator. The result? You'll get more out of the entire system.

If you'd like to watch a program on the new HP 2626 display station, or any of our terminals, just call your local HP sales office listed in the White Pages. You can also write for more information to Hewlett-Packard, Attn: Tom Anderson, Dept. 389, 974 East Arques Ave., Sunnyvale, CA 94086.

Vendor Name	Address	City
Hewlett-Packard	1273 CRESTON WAY	SAN JOSE
Woucher Date	1/1/73	Purchase Assembly
Item No.	57	
QTY	1	
ITEM DESCRIPTION	FINISHED STEEL CASTINGS	
QTY	1	
ITEM DESCRIPTION	TAPE TRANSPORT BACKPLATES	
QTY	1	
ITEM DESCRIPTION	MILLED FLANGE ASSEMBLIES	
QTY	1	
ITEM DESCRIPTION	UNASSEMBLED	H.C. DOUGLAS

Interoffice Memo
To: Beth and John.

The meeting which previously had been scheduled for next week will take place on Thursday at 8:00.

There is obviously a great deal of emphasis being placed on the importance of our project.

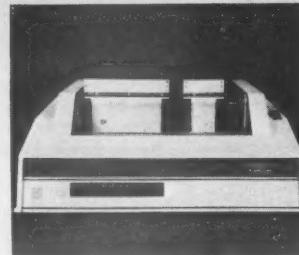
Bob

345 FOR C1472 TO LENNIE
346 FOR C1472 TO LENNIE
347 FOR C1472 TO LENNIE
348 FOR C1472 TO LENNIE
349 FOR C1472 TO LENNIE
350 FOR C1472 TO LENNIE
351 FOR C1472 TO LENNIE
352 FOR C1472 TO LENNIE
353 FOR C1472 TO LENNIE
354 FOR C1472 TO LENNIE
355 FOR C1472 TO LENNIE
356 FOR C1472 TO LENNIE
357 FOR C1472 TO LENNIE
358 FOR C1472 TO LENNIE
359 FOR C1472 TO LENNIE
360 FOR C1472 TO LENNIE
361 FOR C1472 TO LENNIE
362 FOR C1472 TO LENNIE
363 FOR C1472 TO LENNIE
364 FOR C1472 TO LENNIE
365 FOR C1472 TO LENNIE
366 FOR C1472 TO LENNIE
367 FOR C1472 TO LENNIE
368 FOR C1472 TO LENNIE
369 FOR C1472 TO LENNIE
370 FOR C1472 TO LENNIE
371 FOR C1472 TO LENNIE
372 FOR C1472 TO LENNIE
373 FOR C1472 TO LENNIE
374 FOR C1472 TO LENNIE
375 FOR C1472 TO LENNIE
376 FOR C1472 TO LENNIE
377 FOR C1472 TO LENNIE
378 FOR C1472 TO LENNIE
379 FOR C1472 TO LENNIE
380 FOR C1472 TO LENNIE
381 FOR C1472 TO LENNIE
382 FOR C1472 TO LENNIE
383 FOR C1472 TO LENNIE
384 FOR C1472 TO LENNIE
385 FOR C1472 TO LENNIE
386 FOR C1472 TO LENNIE
387 FOR C1472 TO LENNIE
388 FOR C1472 TO LENNIE
389 FOR C1472 TO LENNIE
390 FOR C1472 TO LENNIE
391 FOR C1472 TO LENNIE
392 FOR C1472 TO LENNIE
393 FOR C1472 TO LENNIE
394 FOR C1472 TO LENNIE
395 FOR C1472 TO LENNIE
396 FOR C1472 TO LENNIE
397 FOR C1472 TO LENNIE
398 FOR C1472 TO LENNIE
399 FOR C1472 TO LENNIE
400 FOR C1472 TO LENNIE
401 FOR C1472 TO LENNIE
402 FOR C1472 TO LENNIE
403 FOR C1472 TO LENNIE
404 FOR C1472 TO LENNIE
405 FOR C1472 TO LENNIE
406 FOR C1472 TO LENNIE
407 FOR C1472 TO LENNIE
408 FOR C1472 TO LENNIE
409 FOR C1472 TO LENNIE
410 FOR C1472 TO LENNIE
411 FOR C1472 TO LENNIE
412 FOR C1472 TO LENNIE
413 FOR C1472 TO LENNIE
414 FOR C1472 TO LENNIE
415 FOR C1472 TO LENNIE
416 FOR C1472 TO LENNIE
417 FOR C1472 TO LENNIE
418 FOR C1472 TO LENNIE
419 FOR C1472 TO LENNIE
420 FOR C1472 TO LENNIE
421 FOR C1472 TO LENNIE
422 FOR C1472 TO LENNIE
423 FOR C1472 TO LENNIE
424 FOR C1472 TO LENNIE
425 FOR C1472 TO LENNIE
426 FOR C1472 TO LENNIE
427 FOR C1472 TO LENNIE
428 FOR C1472 TO LENNIE
429 FOR C1472 TO LENNIE
430 FOR C1472 TO LENNIE
431 FOR C1472 TO LENNIE
432 FOR C1472 TO LENNIE
433 FOR C1472 TO LENNIE
434 FOR C1472 TO LENNIE
435 FOR C1472 TO LENNIE
436 FOR C1472 TO LENNIE
437 FOR C1472 TO LENNIE
438 FOR C1472 TO LENNIE
439 FOR C1472 TO LENNIE
440 FOR C1472 TO LENNIE
441 FOR C1472 TO LENNIE
442 FOR C1472 TO LENNIE
443 FOR C1472 TO LENNIE
444 FOR C1472 TO LENNIE
445 FOR C1472 TO LENNIE
446 FOR C1472 TO LENNIE
447 FOR C1472 TO LENNIE
448 FOR C1472 TO LENNIE
449 FOR C1472 TO LENNIE
450 FOR C1472 TO LENNIE
451 FOR C1472 TO LENNIE
452 FOR C1472 TO LENNIE
453 FOR C1472 TO LENNIE
454 FOR C1472 TO LENNIE
455 FOR C1472 TO LENNIE
456 FOR C1472 TO LENNIE
457 FOR C1472 TO LENNIE
458 FOR C1472 TO LENNIE
459 FOR C1472 TO LENNIE
460 FOR C1472 TO LENNIE
461 FOR C1472 TO LENNIE
462 FOR C1472 TO LENNIE
463 FOR C1472 TO LENNIE
464 FOR C1472 TO LENNIE
465 FOR C1472 TO LENNIE
466 FOR C1472 TO LENNIE
467 FOR C1472 TO LENNIE
468 FOR C1472 TO LENNIE
469 FOR C1472 TO LENNIE
470 FOR C1472 TO LENNIE
471 FOR C1472 TO LENNIE
472 FOR C1472 TO LENNIE
473 FOR C1472 TO LENNIE
474 FOR C1472 TO LENNIE
475 FOR C1472 TO LENNIE
476 FOR C1472 TO LENNIE
477 FOR C1472 TO LENNIE
478 FOR C1472 TO LENNIE
479 FOR C1472 TO LENNIE
480 FOR C1472 TO LENNIE
481 FOR C1472 TO LENNIE
482 FOR C1472 TO LENNIE
483 FOR C1472 TO LENNIE
484 FOR C1472 TO LENNIE
485 FOR C1472 TO LENNIE
486 FOR C1472 TO LENNIE
487 FOR C1472 TO LENNIE
488 FOR C1472 TO LENNIE
489 FOR C1472 TO LENNIE
490 FOR C1472 TO LENNIE
491 FOR C1472 TO LENNIE
492 FOR C1472 TO LENNIE
493 FOR C1472 TO LENNIE
494 FOR C1472 TO LENNIE
495 FOR C1472 TO LENNIE
496 FOR C1472 TO LENNIE
497 FOR C1472 TO LENNIE
498 FOR C1472 TO LENNIE
499 FOR C1472 TO LENNIE
500 FOR C1472 TO LENNIE
501 FOR C1472 TO LENNIE
502 FOR C1472 TO LENNIE
503 FOR C1472 TO LENNIE
504 FOR C1472 TO LENNIE
505 FOR C1472 TO LENNIE
506 FOR C1472 TO LENNIE
507 FOR C1472 TO LENNIE
508 FOR C1472 TO LENNIE
509 FOR C1472 TO LENNIE
510 FOR C1472 TO LENNIE
511 FOR C1472 TO LENNIE
512 FOR C1472 TO LENNIE
513 FOR C1472 TO LENNIE
514 FOR C1472 TO LENNIE
515 FOR C1472 TO LENNIE
516 FOR C1472 TO LENNIE
517 FOR C1472 TO LENNIE
518 FOR C1472 TO LENNIE
519 FOR C1472 TO LENNIE
520 FOR C1472 TO LENNIE
521 FOR C1472 TO LENNIE
522 FOR C1472 TO LENNIE
523 FOR C1472 TO LENNIE
524 FOR C1472 TO LENNIE
525 FOR C1472 TO LENNIE
526 FOR C1472 TO LENNIE
527 FOR C1472 TO LENNIE
528 FOR C1472 TO LENNIE
529 FOR C1472 TO LENNIE
530 FOR C1472 TO LENNIE
531 FOR C1472 TO LENNIE
532 FOR C1472 TO LENNIE
533 FOR C1472 TO LENNIE
534 FOR C1472 TO LENNIE
535 FOR C1472 TO LENNIE
536 FOR C1472 TO LENNIE
537 FOR C1472 TO LENNIE
538 FOR C1472 TO LENNIE
539 FOR C1472 TO LENNIE
540 FOR C1472 TO LENNIE
541 FOR C1472 TO LENNIE
542 FOR C1472 TO LENNIE
543 FOR C1472 TO LENNIE
544 FOR C1472 TO LENNIE
545 FOR C1472 TO LENNIE
546 FOR C1472 TO LENNIE
547 FOR C1472 TO LENNIE
548 FOR C1472 TO LENNIE
549 FOR C1472 TO LENNIE
550 FOR C1472 TO LENNIE
551 FOR C1472 TO LENNIE
552 FOR C1472 TO LENNIE
553 FOR C1472 TO LENNIE
554 FOR C1472 TO LENNIE
555 FOR C1472 TO LENNIE
556 FOR C1472 TO LENNIE
557 FOR C1472 TO LENNIE
558 FOR C1472 TO LENNIE
559 FOR C1472 TO LENNIE
560 FOR C1472 TO LENNIE
561 FOR C1472 TO LENNIE
562 FOR C1472 TO LENNIE
563 FOR C1472 TO LENNIE
564 FOR C1472 TO LENNIE
565 FOR C1472 TO LENNIE
566 FOR C1472 TO LENNIE
567 FOR C1472 TO LENNIE
568 FOR C1472 TO LENNIE
569 FOR C1472 TO LENNIE
570 FOR C1472 TO LENNIE
571 FOR C1472 TO LENNIE
572 FOR C1472 TO LENNIE
573 FOR C1472 TO LENNIE
574 FOR C1472 TO LENNIE
575 FOR C1472 TO LENNIE
576 FOR C1472 TO LENNIE
577 FOR C1472 TO LENNIE
578 FOR C1472 TO LENNIE
579 FOR C1472 TO LENNIE
580 FOR C1472 TO LENNIE
581 FOR C1472 TO LENNIE
582 FOR C1472 TO LENNIE
583 FOR C1472 TO LENNIE
584 FOR C1472 TO LENNIE
585 FOR C1472 TO LENNIE
586 FOR C1472 TO LENNIE
587 FOR C1472 TO LENNIE
588 FOR C1472 TO LENNIE
589 FOR C1472 TO LENNIE
590 FOR C1472 TO LENNIE
591 FOR C1472 TO LENNIE
592 FOR C1472 TO LENNIE
593 FOR C1472 TO LENNIE
594 FOR C1472 TO LENNIE
595 FOR C1472 TO LENNIE
596 FOR C1472 TO LENNIE
597 FOR C1472 TO LENNIE
598 FOR C1472 TO LENNIE
599 FOR C1472 TO LENNIE
600 FOR C1472 TO LENNIE
601 FOR C1472 TO LENNIE
602 FOR C1472 TO LENNIE
603 FOR C1472 TO LENNIE
604 FOR C1472 TO LENNIE
605 FOR C1472 TO LENNIE
606 FOR C1472 TO LENNIE
607 FOR C1472 TO LENNIE
608 FOR C1472 TO LENNIE
609 FOR C1472 TO LENNIE
610 FOR C1472 TO LENNIE
611 FOR C1472 TO LENNIE
612 FOR C1472 TO LENNIE
613 FOR C1472 TO LENNIE
614 FOR C1472 TO LENNIE
615 FOR C1472 TO LENNIE
616 FOR C1472 TO LENNIE
617 FOR C1472 TO LENNIE
618 FOR C1472 TO LENNIE
619 FOR C1472 TO LENNIE
620 FOR C1472 TO LENNIE
621 FOR C1472 TO LENNIE
622 FOR C1472 TO LENNIE
623 FOR C1472 TO LENNIE
624 FOR C1472 TO LENNIE
625 FOR C1472 TO LENNIE
626 FOR C1472 TO LENNIE
627 FOR C1472 TO LENNIE
628 FOR C1472 TO LENNIE
629 FOR C1472 TO LENNIE
630 FOR C1472 TO LENNIE
631 FOR C1472 TO LENNIE
632 FOR C1472 TO LENNIE
633 FOR C1472 TO LENNIE
634 FOR C1472 TO LENNIE
635 FOR C1472 TO LENNIE
636 FOR C1472 TO LENNIE
637 FOR C1472 TO LENNIE
638 FOR C1472 TO LENNIE
639 FOR C1472 TO LENNIE
640 FOR C1472 TO LENNIE
641 FOR C1472 TO LENNIE
642 FOR C1472 TO LENNIE
643 FOR C1472 TO LENNIE
644 FOR C1472 TO LENNIE
645 FOR C1472 TO LENNIE
646 FOR C1472 TO LENNIE
647 FOR C1472 TO LENNIE
648 FOR C1472 TO LENNIE
649 FOR C1472 TO LENNIE
650 FOR C1472 TO LENNIE
651 FOR C1472 TO LENNIE
652 FOR C1472 TO LENNIE
653 FOR C1472 TO LENNIE
654 FOR C1472 TO LENNIE
655 FOR C1472 TO LENNIE
656 FOR C1472 TO LENNIE
657 FOR C1472 TO LENNIE
658 FOR C1472 TO LENNIE
659 FOR C1472 TO LENNIE
660 FOR C1472 TO LENNIE
661 FOR C1472 TO LENNIE
662 FOR C1472 TO LENNIE
663 FOR C1472 TO LENNIE
664 FOR C1472 TO LENNIE
665 FOR C1472 TO LENNIE
666 FOR C1472 TO LENNIE
667 FOR C1472 TO LENNIE
668 FOR C1472 TO LENNIE
669 FOR C1472 TO LENNIE
670 FOR C1472 TO LENNIE
671 FOR C1472 TO LENNIE
672 FOR C1472 TO LENNIE
673 FOR C1472 TO LENNIE
674 FOR C1472 TO LENNIE
675 FOR C1472 TO LENNIE
676 FOR C1472 TO LENNIE
677 FOR C1472 TO LENNIE
678 FOR C1472 TO LENNIE
679 FOR C1472 TO LENNIE
680 FOR C1472 TO LENNIE
681 FOR C1472 TO LENNIE
682 FOR C1472 TO LENNIE
683 FOR C1472 TO LENNIE
684 FOR C1472 TO LENNIE
685 FOR C1472 TO LENNIE
686 FOR C1472 TO LENNIE
687 FOR C1472 TO LENNIE
688 FOR C1472 TO LENNIE
689 FOR C1472 TO LENNIE
690 FOR C1472 TO LENNIE
691 FOR C1472 TO LENNIE
692 FOR C1472 TO LENNIE
693 FOR C1472 TO LENNIE
694 FOR C1472 TO LENNIE
695 FOR C1472 TO LENNIE
696 FOR C1472 TO LENNIE
697 FOR C1472 TO LENNIE
698 FOR C1472 TO LENNIE
699 FOR C1472 TO LENNIE
700 FOR C1472 TO LENNIE
701 FOR C1472 TO LENNIE
702 FOR C1472 TO LENNIE
703 FOR C1472 TO LENNIE
704 FOR C1472 TO LENNIE
705 FOR C1472 TO LENNIE
706 FOR C1472 TO LENNIE
707 FOR C1472 TO LENNIE
708 FOR C1472 TO LENNIE
709 FOR C1472 TO LENNIE
710 FOR C1472 TO LENNIE
711 FOR C1472 TO LENNIE
712 FOR C1472 TO LENNIE
713 FOR C1472 TO LENNIE
714 FOR C1472 TO LENNIE
715 FOR C1472 TO LENNIE
716 FOR C1472 TO LENNIE
717 FOR C1472 TO LENNIE
718 FOR C1472 TO LENNIE
719 FOR C1472 TO LENNIE
720 FOR C1472 TO LENNIE
721 FOR C1472 TO LENNIE
722 FOR C1472 TO LENNIE
723 FOR C1472 TO LENNIE
724 FOR C1472 TO LENNIE
725 FOR C1472 TO LENNIE
726 FOR C1472 TO LENNIE
727 FOR C1472 TO LENNIE
728 FOR C1472 TO LENNIE
729 FOR C1472 TO LENNIE
730 FOR C1472 TO LENNIE
731 FOR C1472 TO LENNIE
732 FOR C1472 TO LENNIE
733 FOR C1472 TO LENNIE
734 FOR C1472 TO LENNIE
735 FOR C1472 TO LENNIE
736 FOR C1472 TO LENNIE
737 FOR C1472 TO LENNIE
738 FOR C1472 TO LENNIE
739 FOR C1472 TO LENNIE
740 FOR C1472 TO LENNIE
741 FOR C1472 TO LENNIE
742 FOR C1472 TO LENNIE
743 FOR C1472 TO LENNIE
744 FOR C1472 TO LENNIE
745 FOR C1472 TO LENNIE
746 FOR C1472 TO LENNIE
747 FOR C1472 TO LENNIE
748 FOR C1472 TO LENNIE
749 FOR C1472 TO LENNIE
750 FOR C1472 TO LENNIE
751 FOR C1472 TO LENNIE
752 FOR C1472 TO LENNIE
753 FOR C1472 TO LENNIE
754 FOR C1472 TO LENNIE
755 FOR C1472 TO LENNIE
756 FOR C1472 TO LENNIE
757 FOR C1472 TO LENNIE
758 FOR C1472 TO LENNIE
759 FOR C1472 TO LENNIE
760 FOR C1472 TO LENNIE
761 FOR C1472 TO LENNIE
762 FOR C1472 TO LENNIE
763 FOR C1472 TO LENNIE
764 FOR C1472 TO LENNIE
765 FOR C1472 TO LENNIE
766 FOR C1472 TO LENNIE
767 FOR C1472 TO LENNIE
768 FOR C1472 TO LENNIE
769 FOR C1472 TO LENNIE
770 FOR C1472 TO LENNIE
771 FOR C1472 TO LENNIE
772 FOR C1472 TO LENNIE
773 FOR C1472 TO LENNIE
774 FOR C1472 TO LENNIE
775 FOR C1472 TO LENNIE
776 FOR C1472 TO LENNIE
777 FOR C1472 TO LENNIE
778 FOR C1472 TO LENNIE
779 FOR C1472 TO LENNIE
780 FOR C1472 TO LENNIE
781 FOR C1472 TO LENNIE
782 FOR C1472 TO LENNIE
783 FOR C1472 TO LENNIE
784 FOR C1472 TO LENNIE
785 FOR C1472 TO LENNIE
786 FOR C1472 TO LENNIE
787 FOR C1472 TO LENNIE
788 FOR C1472 TO LENNIE
789 FOR C1472 TO LENNIE
790 FOR C1472 TO LENNIE
791 FOR C1472 TO LENNIE
792 FOR C1472 TO LENNIE
793 FOR C1472 TO LENNIE
794 FOR C1472 TO LENNIE
795 FOR C1472 TO LENNIE
796 FOR C1472 TO LENNIE
797 FOR C1472 TO LENNIE
798 FOR C1472 TO LENNIE
799 FOR C1472 TO LENNIE
800 FOR C1472 TO LENNIE
801 FOR C1472 TO LENNIE
802 FOR C1472 TO LENNIE
803 FOR C1472 TO LENNIE
804 FOR C1472 TO LENNIE
805 FOR C1472 TO LENNIE
806 FOR C1472 TO LENNIE
807 FOR C1472 TO LENNIE
808 FOR C1472 TO LENNIE
809 FOR C1472 TO LENNIE
810 FOR C1472 TO LENNIE
811 FOR C1472 TO LENNIE
812 FOR C1472 TO LENNIE
813 FOR C1472 TO LENNIE
814 FOR C1472 TO LENNIE
815 FOR C1472 TO LENNIE
816 FOR C1472 TO LENNIE
817 FOR C1472 TO LENNIE
818 FOR C1472 TO LENNIE
819 FOR C1472 TO LENNIE
820 FOR C1472 TO LENNIE
821 FOR C1472 TO LENNIE
822 FOR C1472 TO LENNIE
823 FOR C1472 TO LENNIE
824 FOR C1472 TO LENNIE
825 FOR C1472 TO LENNIE
826 FOR C1472 TO LENNIE
827 FOR C1472 TO LENNIE
828 FOR C1472 TO LENNIE
829 FOR C1472 TO LENNIE
830 FOR C1472 TO LENNIE
831 FOR C1472 TO LENNIE
832 FOR C1472 TO LENNIE
833 FOR C1472 TO LENNIE
834 FOR C1472 TO LENNIE
835 FOR C1472 TO LENNIE
836 FOR C1472 TO LENNIE
837 FOR C1472 TO LENNIE
838 FOR C1472 TO LENNIE
839 FOR C1472 TO LENNIE
840 FOR C1472 TO LENNIE
841 FOR C1472 TO LENNIE
842 FOR C1472 TO LENNIE
843 FOR C1472 TO LENNIE
844 FOR C1472 TO LENNIE
845 FOR C1472 TO LENNIE
846 FOR C1472 TO LENNIE
847 FOR C1472 TO LENNIE
848 FOR C1472 TO LENNIE
849 FOR C1472 TO LENNIE
850 FOR C1472 TO LENNIE
851 FOR C1472 TO LENNIE
852 FOR C1472 TO LENNIE
853 FOR C1472 TO LENNIE
854 FOR C1472 TO LENNIE
855 FOR C1472 TO LENNIE
856 FOR C1472 TO LENNIE
857 FOR C1472 TO LENNIE
858 FOR C1472 TO LENNIE
859 FOR C1472 TO LENNIE
860 FOR C1472 TO LENNIE
861 FOR C1472 TO LENNIE
862 FOR C1472 TO LENNIE
863 FOR C1472 TO LENNIE
864 FOR C1472 TO LENNIE
865 FOR C1472 TO LENNIE
866 FOR C1472 TO LENNIE
867 FOR C1472 TO LENNIE
868 FOR C1472 TO LENNIE
869 FOR C1472 TO LENNIE
870 FOR C1472 TO LENNIE
871 FOR C1472 TO LENNIE
872 FOR C1472 TO LENNIE
873 FOR C1472 TO LENNIE
874 FOR C1472 TO LENNIE
875 FOR C1472 TO LENNIE
876 FOR C1472 TO LENNIE
877 FOR C1472 TO LENNIE
878 FOR C1472 TO LENNIE
879 FOR C1472 TO LENNIE
880 FOR C1472 TO LENNIE
881 FOR C1472 TO LENNIE
882 FOR C1472 TO LENNIE
883 FOR C1472 TO LENNIE
884 FOR C1472 TO LENNIE
885 FOR C1472 TO LENNIE
886 FOR C1472 TO LENNIE
887 FOR C1472 TO LENNIE
888 FOR C1472 TO LENNIE
889 FOR C1472 TO LENNIE
890 FOR C1472 TO LENNIE
891 FOR C1472 TO LENNIE
892 FOR C1472 TO LENNIE
893 FOR C1472 TO LENNIE
894 FOR C1472 TO LENNIE
895 FOR C1472 TO LENNIE
896 FOR C1472 TO LENNIE
897 FOR C1472 TO LENNIE
898 FOR C1472 TO LENNIE
899 FOR C1472 TO LENNIE
900 FOR C1472 TO LENNIE
901 FOR C1472 TO LENNIE
902 FOR C1472 TO LENNIE
903 FOR C1472 TO LENNIE
904 FOR C1472 TO LENNIE
905 FOR C1472 TO LENNIE
906 FOR C1472 TO LENNIE
907 FOR C1472 TO LENNIE
908 FOR C1472 TO LENNIE
909 FOR C1472 TO LENNIE
910 FOR C1472 TO LENNIE
911 FOR C1472 TO LENNIE
912 FOR C1472 TO LENNIE
913 FOR C1472 TO LENNIE
914 FOR C1472 TO LENNIE
915 FOR C1472 TO LENNIE
916 FOR C1472 TO LENNIE
917 FOR C1472 TO LENNIE
918 FOR C1472 TO LENNIE
919 FOR C1472 TO LENNIE
920 FOR C1472 TO LENNIE
921 FOR C1472 TO LENNIE
922 FOR C1472 TO LENNIE
923 FOR C1472 TO LENNIE
924 FOR C1472 TO LENNIE
925 FOR C1472 TO LENNIE
926 FOR C1472 TO LENNIE
927 FOR C1472 TO LENNIE
928 FOR C1472 TO LENNIE
929 FOR C1472 TO LENNIE
930 FOR C1472 TO LENNIE
931 FOR C1472 TO LENNIE
932 FOR C1472 TO LENNIE
933 FOR C1472 TO LENNIE
934 FOR C1472 TO LENNIE
935 FOR C1472 TO LENNIE
936 FOR C1472 TO LENNIE

Terminet 200 Allows Printing Of Two Forms

WAYNESBORO, Va. — The Data Communication Products Business Department of General Electric Co. has introduced Terminet 200, a split-plate line printer that allows users to independently print two forms simultaneously.

The printer offers operation at up to 9,600 bit/sec at a maximum speed of 200 char./sec. Strappable selections provide for operations at 110-, 150-,



Terminet 200

200-, 300-, 600-, 1,200-, 2,400- and 4,800 bit/sec, the vendor said.

Terminet 200 costs \$3,895.

The vendor is headquartered at Waynesboro, Va. 22908.

Printer Sets Terminal Data

DALLAS — Mepcom International, Inc. has announced a dot-matrix impact printer that is said to offer economical data printing capabilities to any CRT terminal.

The EZ Print 21, designed primarily for small-screen CRT terminals, records an audit trail of all terminal data on a standard adding machine paper tape, a company spokesman said.

The desktop printer patches into an RJ11C modular or RS-232C interface outlet.

It prints in a 21-col format at a maximum throughput rate of 42.5 char./sec. A buffer allows input at 120 char./sec.

The unit costs \$395. Mepcom International is at Suite 301, 2619 Electronic Lane, Dallas, Texas 75220.

Traders Get Space Saver

NEW YORK — Arbat Systems Ltd. has announced Space Saver, a trader's CRT terminal that reportedly can be linked to both the Arbat Banking System and various financial services.

With Space Saver, the CRT terminal is now divided into three components: a screen as small as seven inches or as large as 22 in., a separate keyboard with specialist trader's function keys and the microprocessor-controlled systems interface unit, an Arbat Systems spokesman said.

The Space Saver is priced at \$3,150, monitor screen included.

Arbat Systems Ltd. is headquartered at 5 Hanover Sq., New York, N.Y. 10004.

Systems Technology Forum Expands Winter Program

BURKE, Va. — Systems Technology Forum has expanded its winter program to start earlier in the year and to be available for the first time in Houston, Phoenix and Boston.

The seminar program previously was available only in San Francisco, Los Angeles, Chicago, Atlanta, New York and Washington, D.C.

Courses include an introduction to data communications, network design, corporate network strategies, introduction to business telecom-

munications and communications technology trends.

Aimed at the novice, the advanced and the manager, courses may be taken separately or in recommended combinations, and each curriculum has been developed to meet particular job function criteria, the firm said.

Each seminar covers three days with prices ranging from \$650 to \$750. The firm is located at 8991 Cotswold Drive, Burke, Va. 22015.

Communications Manual Available

LOMBARD, Ill. — A manual offering a methodology for defining, planning, controlling, developing and implementing data communication systems is now available from Cara Corp.

The manual is a compilation of the efforts of individuals with more than 200 man-years of data communications experience, a Cara spokesman

said. Over 1,500 hours have been spent translating these detailed topics into terms useful and meaningful to corporate and DP management, he claimed.

The manual, "Data Communications . . . Survey & Procedures," costs \$795. Cara is in Suite 110, 611 E. Butterfield Road, Lombard, Ill. 60148.

Retro-Graphics Added to VT100

SACRAMENTO, Calif. — Digital Engineering, Inc. has announced the Retro-Graphics enhancement for the Digital Equipment Corp. VT100 CRT terminal. Features of the upgraded VT-100 include multiple character sizes, dot-dash lines, point plotting, vector drawing and selective erase for updating the graphics display, the vendor said.

Graphics are displayed in green tone on the 12-in. nonglare screen at 640 by 480 resolution, the vendor said.

The VT-100 is reportedly compatible with most existing graphics software including Tektronix, Inc. Plot-10 and Issco's Disspla and Tellagraf.

The terminal costs \$3,495 from Digital Engineering, Inc., 630 Bercut Drive, Sacramento, Calif. 95814.

BE A PART OF THE DATABASE REVOLUTION

Learn the newest concepts in Database design, Database administration, and Data Resource management. Learn it in depth. From Yourdon.

If you analyze your fellow workers, you will find that Yourdon-trained people manage noticeably better.

Join them. Take advantage of the new Database Revolution. Superficial knowledge is no longer enough.

Below is a brief description of the new Yourdon Database curriculum. It goes far beyond the one-sided training of the past. Master it, and move smartly ahead.

Choose from the following intensive courses:

1. Database for Managers. This one-day seminar explains database concepts to management. It discusses planning procedures, requirements analysis, database prototyping, data resource administration, and database administration.

2. Database Modeling and Design Workshop. A five-day seminar that teaches the most advanced forms of database design. It be-

gins with procedures for Requirements Analysis. It presents the most highly developed discipline of Information Modeling in the industry.

3. Database Administrator's Workshop. This five-day seminar defines the task objectives and responsibilities of database administration. It focuses on the disciplines of design, implementation, control, maintenance, and reporting.

4. Database Modeling and Design Lectures. A three-day version of #2 above, in lecture form only.

5. Database Administrator's Lectures. A condensed three-day version of #3 above, in lecture form only.

Your time is valuable, so Yourdon will cram every hour of every course with a barrage of fact and example.

For more information on courses and dates and cities where the courses will be given, telephone Yourdon toll free or mail this coupon:

I want to make the most of the Database Revolution. Please send information on the following courses:

- 1. Database for Managers
- 2. Database Modeling and Design Workshop
- 3. Database Administrator's Workshop
- 4. Database Modeling and Design Lectures
- 5. Database Administrator's Lectures

Name _____

Company _____ Title _____

Address _____ City _____

State _____ Zip _____ Phone _____

YOURDON
1133 Ave. of the Americas, New York, NY 10036
Phone (212) 730-2670

**Call toll-free 800 223-2452.
In New York or Canada call collect: 212 730-2670.**

Becomes First IPL 4443 User Firm Finds Shipment Delay Pays Off

Special to CW

HOPKINTON, Mass. — To a deadline-pressed user, extended equipment delivery dates are anathema. For a service bureau and facilities manager here, however, the future shipment shuffle paid off.

Data Distributors, Inc. (DDI) reportedly doubled its throughput by replacing its overworked IBM 370/145 with an IPL Systems, Inc. Model 4443 processor. The company had ordered an IBM 4341, but became the first end user of the 4341-1-compatible mainframe when IBM assigned a delivery date that would have had DDI waiting for more than a year.

"We considered leasing a 370/158 for the interim, but it had too many drawbacks, like high maintenance costs and inefficient power and space requirements," Roger Challen, DDI's president, stated. "We decided instead to look for a machine that had the potential to grow with us."

DDI is a fast-moving company that handles a variety of diverse on-line and batch-processing applications. Currently, the firm serves as facilities manager for Super Mar-

ket Distributors Corp., taking care of on-line inventory, billing and sales analysis for thousands of rack items for the company's more than 2,000 northeastern supermarket customers.

As a service bureau, DDI has its processing hands in on-line data base management, payroll and accounting applications and investment portfolio management, Challen noted.

Obsolete Processor

According to DDI's president, the firm learned quickly that its IBM 370/145 was fast becoming obsolete as a processing tool.

Basically, the IBM processor "was causing degraded response time on information important to our customers," Challen pointed out. "It simply didn't have sufficient cycle time or memory to support our requirements, much less handle additional applications."

At the time, DDI was working with Business Systems Associates, Inc. (BSA) another service bureau, to establish a joint data center. BSA was then performing batch processing of material requirements planning,

materials management and shop-floor scheduling for a number of major electronics firms.

"Since they were developing a major on-line manufacturing system, the need for more computing capability was critical," Challen noted.

Options Reviewed

It was then that DDI reviewed its alternatives. The company contacted several plug-compatible vendors, including IPL, and also sought to improve the delivery date on the IBM 4341.

Unfortunately, IBM refused to budge the distant delivery schedule, which forced Challen to reassess his plug-compatible alternatives.

DDI contacted IPL, worked out the contractual details and in May became the IPL 4443 beta test site. Presently, DDI's system is equipped with 2M bytes of memory, four block multiplexer channels and one byte multiplexer channel for communications, 10 3350-type disk drives and four tape drives. However, the disk and tape units will soon be replaced by Storage Technology Corp.

(Continued on Page 80)

SYSTEMS & PERIPHERALS

Honeywell Warns Of Fire Hazard

WALTHAM, Mass. — To deal with a potential fire hazard, Honeywell, Inc. has issued a field engineering change order that modifies the static eliminator bars on the company's drum printers manufactured since 1966.

The bars, when used in conjunction with nonfused transformers, may cause an electrical breakdown in the end piece area and possibly generate heat sufficient to cause a fire hazard, the company said.

The company said it will, wherever needed and at no charge, replace nonfused transformers with fused ones; replace the static bars and end pieces with ones manufactured of nonflammable materials; and relocate the bars from below the paper path to above it.

The company has urged all Honeywell drum printer users to contact the nearest Honeywell engineering or sales office to see if their drum printers require modification.

System Integrates Financial Tasks

WINTER PARK, Fla. — A computer system designed to integrate the back-office operations, planning and marketing services of financial institutions has been announced by Systeme Corp.

The Financial Information and Control System (Fics) includes six subsystems: Financial Planning and Modeling, Total Loans in Process, New Account Processing, Wordplus (word processing), Electronic Mailbox and General Accounting.

Users can incorporate all or some of the subsystems, expandable or modifiable at any time. Fics features an integrated information base shared among all subsystems.

Fics reportedly can interface with all central computer systems currently used by financial institutions. With many hardware and software options to choose from, systems range in price from \$75,000 to \$450,000, depending on the number of terminals and subsystems desired, a spokesman said from 1095 S. Semoran Blvd., Winter Park, Fla. 32792.

Group Formed For Managers Of Operations

SANTA ANA, Calif. — Data Center Management Services has announced the formation of the Association for Computer Operations Managers (Afcom), reportedly created to meet the needs of the professional computer operations manager.

In its bimonthly publication, "The Computer Operations Manager," Afcom will address both the latest state-of-the-art technology and management techniques available to operations managers, Afcom said.

Afcom members will be sent an annual salary survey of computer operations positions, and the association will also host special conferences dealing with computer operations.

Charter membership for one year is \$115. Data Center Management Services is at 3605 E. South Bristol, Santa Ana, Calif. 92704.

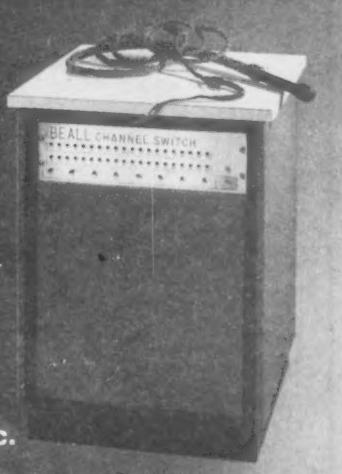
A Simon Legree for Computers

The Beall Channel Switch. Makes computers, peripherals work harder, more effectively. Directs critical on-line services to another CPU when failure occurs. Commands specific peripherals to serve more than one computer. Redrives all CPU signals to give far more flexibility in physical placement of peripherals.

And Beall does all of this less expensively, more reliably and with less opportunity for operator confusion than anyone else.

We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Want to whip up more facts? They're in our new brochure. Write or call for it today.



John Beall & Company, Inc.

9103 Third Avenue • North Bergen, N.J. 07047 U.S.A. • 201/854-3562



The Burroughs S4100

Burroughs Offers Document System

DETROIT — Burroughs Corp. has introduced a multipocket, document proof and encoding system called the S4100.

The S4100 was designed to help financial institutions process checks, credit card receipts, utility bills and other kinds of payment documents.

The controls, operator display and master printer are grouped into one unit in order to minimize operator head and eye movement, a Burroughs spokesman said.

Both the "burst printer," which prepares detail lists and audit information at speeds of 2,200 char./sec., and a micro minidisk unit for loading programs and storing data are located within reach of the operator, the spokesman continued.

With the S4100 is a software installation kit containing software, system disks and documentation, which will enable a Burroughs field representative to install the system as soon as it arrives at the customer's site, Bur-

roughs claimed.

Deliveries of the S4100 will begin immediately. The system can be purchased for \$20,990 or leased for \$678/mo on a three-year lease, including maintenance.

Scanning System Handles Business Inventory Control

EUGENE, Ore. — A microprocessor-based scanning system for business inventory control has been developed by Western Computer Systems, Inc.

Utilizing hardware based on the Alpha Microsystems, Inc. 15-bit microprocessor chip set, the Model 580 can

be used with hand-held wand and tabletop laser scanners to read UPC and other bar code symbols.

Systems range from \$10,000 to \$90,000, depending on disk storage, number of terminals and printers, processor speed and software customization.

Western Computer Systems is headquartered at 1000 Bertelsen, P.O. Box 10191, Eugene, Ore. 97402.

Seminars Target DP Professional

WELLESLEY HILLS, Mass. — Management Advisory Services and Publications is offering a series of seminars on DP auditing, security, control and system quality assurance.

Taking place in Boston, New York, San Francisco, Washington, D.C., Miami and Minneapolis, the seminars range in price from \$390 to \$840.

The firm also offers a series of publications on computer security that range in cost from \$35 a year to \$495 a year.

More information is available from the firm through P.O. Box 151, Wellesley Hills, Mass. 02181.

Shipment Delay Pays Off

(Continued from Page 79)
3350-type spindles and 4500 series tape drives, Challen said.

DDI selected the IPL 4443 over other plug-compatible competitors because of IPL's successful emulation of IBM's 4300 microcode on the new machine. Challen was also familiar with the design reputation of IPL's Omega 480-3 processor, supplied to Control Data Corp., whose modified architecture is incorporated into the 4443.

Performance, Upgrades

Finally, DDI also chose the IPL system because of the processor's performance capabilities and ease of upgrade.

"The 4443 gives us the option of up to 8M bytes of memory, which is double the capacity IBM offers. When we upgrade, IPL will let us do it in the field," Challen indicated.

DDI's system currently runs VM, DOS/VSE and DOS/VSE, VMS, VMS and local and remote CICS, Challen added.

Also, in addition to investigating packaged data base systems, the company's plans for the future call for two production systems using DOS/VSE releases 2 and 3 for both on-line and batch processing, a company spokesman indicated.

Discover the incredible potential in DP productivity.



A 1000% INCREASE IN DP PRODUCTIVITY. IMPOSSIBLE? JAMES MARTIN SAYS IT'S WITHIN YOUR GRASP TODAY!



The James Martin World Seminar focuses your attention on changes that are possible today, and changes that will be forced upon you in the near future.

Send for complete seminar information today.

Techniques Now Exist for a 1000% Improvement in Application Creation Productivity.

Is productivity solely a function of some lucky and magic blend of hardware and software? Or is it something subtler, more far-reaching than the "easy" answers? James Martin will set your thinking straight with a practical, in-depth, five-day seminar that will show you the path toward productivity — with increases of up to 1000%.

Application Development Without Programmers Is the Key to Productivity.

Programming in languages of the level of COBOL is a slow way to develop applications. And structured programming can only promise increases in productivity of 25-35%. Many diverse facilities are now becoming available which permit such programming to be bypassed for many computer users. END-USERS WILL BE ABLE TO CREATE THEIR OWN APPLICATIONS WITHOUT THE USE OF REQUIREMENTS DOCUMENTS. Hear about the experience and problems with these new facilities. Learn new forms of system design and management.

JAMES MARTIN

James Martin is the man whom *Computerworld* described as "...the computer industry's most widely read author, best attended lecturer and foremost authority on the social and commercial impact of computers... Forceful and magnetic on stage..."

The James Martin World Seminar is a professional event of the first magnitude. The nation's leading DP managers will attend as well as those who want their first glimpse at the incredible potential for productivity improvement promised by the state-of-the-art.

Now, while it is on your mind, and while there is still time to make the best decision, send for full seminar information. Learn the full scope of this seminar and take the opportunity to make your registration.

AUDIENCE

The first day of the seminar is designed for attendance by non-technical managers (see below) as well as technical personnel. The four succeeding days elaborate and expand concepts for technical attendees (e.g., systems analysts, designers, programmers, data base administrators, teleprocessing and network specialists, and end users). Take a moment to fill out the coupon and you will receive the complete seminar syllabus.

SENIOR MANAGEMENT DAY

Invite your non-technical supervisors to attend the first day so they will understand and support the productivity proposals you make later on.

For the first time in North America, senior managers will have the opportunity to hear James Martin in a one-day, self-contained seminar. Mr. Martin has designated the first day of his five-day World Seminar as Senior Management Day. It is designed to give managers the facts they need to understand data processing trends, proposals, and planning criteria.

March 16-20, 1981
March 23-27, 1981
April 6-10, 1981
April 13-17, 1981

Los Angeles
Miami
Las Vegas
New York

Call or write for full seminar information.

CW 1/28

Please send me more information about
JAMES MARTIN'S WORLD SEMINAR

Name _____

Title _____

Address _____

City _____

State _____

Zip _____

Telephone _____

TECHNOLOGY TRANSFER INSTITUTE

P.O. Box 49765
Los Angeles, CA 90049
(213) 394-8305

Bits & Pieces

Portable System Repairs Printed Circuit Boards

LAUREL, Md. — A self-contained, portable system for printed circuit board (PCB) field repair is available from Pace, Inc.

Designed for repair and field service organizations, the 4.5-pound Pace Micro unit may be carried by hand or in a tool case along with a full complement of tools, the vendor claimed. A single handpiece performs both desoldering and soldering operations using interchangeable tips, with full temperature regulation.

The product can operate from either standard ac line sources or from 12 Vdc power and costs \$395, the vendor said from 9893 Brewers Court, Laurel, Md. 20810.

Graphics Option Offered For Media 12/7 Printer

NASHUA, N.H. — Sanders Technology is offering a graphics option for its Media 12/7 typographic printer that allows line drawing and coarse grayscale drawings to be created on the printer.

The graphics option consists of a memory expansion board, two graphics fonts and special version of the printer software.

The graphics option is available for \$500, the vendor said from Box 1226, Nashua, N.H. 03061.

Reference Charts Provide Forms and Media Specs

ARLINGTON, Va. — A series of five Quick Reference Charts reportedly providing access to forms and media specifications on the range of forms-using devices is now available from International Business Forms Industries, Inc.

The charts detail information on line printers, matrix printers, character printers, optical scanners and forms handling equipment.

The charts, prepunched for notebook reference, are priced at \$8.50 each, or \$40 for the set of five with quantity discounts available from the firm at 1730 Lynn St., Arlington, Va. 22209.

Methodology Aids Planning, Design, Upkeep of Systems

CHICAGO — A methodology for planning, designing, implementing and maintaining information processing systems is available from Arthur Andersen & Co.

Method/1, consisting of books, training, on-site installation and consulting services, is aimed at both small and large systems environments, according to a company spokesman.

A minimum cost of \$30,000 — which buys the methodology and its installation — "could increase substantially" depending on the needs of the user, the spokesman explained from 69 W. Washington St., Chicago, Ill. 60602.

Compuscan Ties Alphaword, CPT 8000 Word Processor

TETERBORO, N.J. — Compuscan, Inc. is offering an interface that connects the firm's Alphaword OCR page reader with the CPT 8000 word processor.

The interface allows text typed on IBM Selectric or other single-element

typewriters to be input directly into the word processor without keying, the vendor said.

The interface costs \$2,000. Compuscan is located at Huyler St., Teterboro, N.J. 07608.

Copy of Graphics Newsletter Available for Free Trial

IRVINE, Calif. — A free copy of the "Computer Graphics Technology Newsletter" is available from Computer Graphics Technology Co. A full subscription costs \$68 annually.

The newsletter is written to keep readers informed of financial, hardware and software changes within the industry.

Computer Graphics Technology Co.

is located at 14632 Comet St., Irvine, Calif. 92714.

Hollerith Tab Card Reader Handles up to 22 columns

MAMARONECK, N.Y. — A Hollerith tab card reader that can read up to 22 columns of alphanumeric punched hole information has been introduced by Sealectro Corp.

The DSR-100 utilizes photo transistors to sense holes on cards that are manually inserted and read one at a time.

Light excitation is by means of multiple LEDs.

The unit costs \$267 from Sealectro Corp., Mamaroneck, N.Y. 10543.

Course Slated On IBM 4300

LOS ANGELES — THE IBM 4300 series and how it fits in with IBM's ideas about centralized data processing will be the topic of a three-day seminar organized by Technology Transfer Institute.

The seminars will be held today through Wednesday in Washington, D.C., and Feb. 2-4 in San Francisco.

Frederic Lamond, an independent consultant and contributor to the computing press, will lead the seminars. According to the organizers, he has completed an in-depth study of the IBM 4300 series.

Registration costs \$675. More information can be obtained from Technology Transfer Institute, P.O. Box 49765, Los Angeles, Calif. 90049.

Peripheral Buyers...

Finally, a Concept that Brings You... A Breath of Fresh Air

Authorized Terminal Distributors (ATD) brings a new dimension to the peripheral buyer. Its unique concept of one-stop shopping enables you to shop with confidence for the terminal which best meets your requirements, at the best available price and with an acceptable delivery time.

Through your local ATD dealer, you have access to a full range of major peripherals. It's a simple matter to choose the one with the features you want. You don't have to worry about being sold an inferior model simply because it's the only one available.

When you do business with an ATD dealer, you do business with a member of the ATD community—an independent businessman who is committed to the pursuit of good business practices.

YOUR ATD DEALER—A BUSINESSMAN WHOSE PRIMARY OBJECTIVE IS YOUR SATISFACTION

For the name of the ATD Dealer nearest you, return the coupon below.

We are interested in this new concept... please have an ATD Authorized Dealer contact us.

Some of the lines we carry...

- Texas Instruments
- Diablo
- General Electric
- Lear Siegler
- Hazeltine
- ADDS
- Digilog
- Tele Video
- Teletype
- Multitec
- Anderson
- Jacobson
- Penril
- Digital Equipment
- Prentice
- Rixon
- Hewlett Packard
- Visual Technology
- Data Media
- Centronics
- Zenith Data Systems
- Okidata
- Digital Engineering
- Sykes

REPS/RESELLERS:

If you are interested in the ATD Member Dealer Program, give us a call at (609) 228-6660.



AUTHORIZED TERMINAL DISTRIBUTOR

P.O. Box 1286 Cole Road & Camden Avenue
Blackwood, N.J. 08012

609/228-6660

800/257-5545



*Look to Perkin-Elmer
for a growing line
of terminals.*

Now, a low-cost smart CRT joins the Bantam family.

Need block mode editing capability? An optional second page? Our new 550S is for you. It's the smart terminal that's priced like a dumb one.

Doing a lot of numeric data entry? Our new 550E has the features you need plus some attractive numeric data of its own—on the price tag.

Want a terminal that's easy to operate and easy on your budget? Our economy Model 550B is the simplest operating CRT you can buy.

And all three come with a full-year warranty on parts and labor.

The smart one.

The star of this low-cost CRT family is the new microprocessor-driven 550S. It's functionally three terminals in one, with distinct operating modes for conversational



On-site and/or depot maintenance services for all Perkin-Elmer terminals are available through our own service force of 450 people located in 53 cities coast-to-coast.

timesharing, transaction processing, and text manipulation or software development.

The new reliable.

The other new member of our 550 family is the highly reliable 550E. Like the 550B, it's driven by a custom LSI chip and has only 19 integrated circuits, giving you a 42,000 hour MTBF. The 550E features a dedicated keypad for numeric entry and cursor movement.

Perkin-Elmer is a Fortune 500 company with terminal sales offices

located in Atlanta, Boston, Chicago, Los Angeles, New York, San Francisco, and throughout Europe. Distributors: Arrow Electronics

- Automated Business Computers
- Computer Peripherals of New England • Computer Peripheral Technology • Data Terminal Mart
- The David Jamison Carlyle Corp.
- International Peripheral Systems
- PAX Computer Company • Selecterm • The Thorson Company
- U.S. Robotics • Westwood Associates.

For more information write: Perkin-Elmer, Marketing Communications, 2 Crescent Place, Oceanport, NJ 07757. **Or call toll free: (800) 631-2154. In NJ, call (201) 870-2412.**

PERKIN-ELMER

At Special Needs Home

Mini Helps Modify Children's Behavior

Special to CW

SACO, Maine — At first glance, computers and child care seem an odd match. There is nothing more impersonal than computers and nothing more personal than taking care of children.

However, a children's home here has successfully incorporated a minicomputer into its behavioral motivation program and uses the machine to custom-tailor the education of 65 special-needs children.

The Sweetser-Children's Home is a live-in treatment center for emotionally disturbed children that started as an orphanage in the 19th century. Residents consist of boys and girls ranging in age from six to 18, each with unique behavioral problems and learning difficulties.

Before turning to a computer, the home's staff processed data and tracked the learning progress of each child with a slow and time-consuming manual system. Since motivational programs changed about two to four times a month as goals were completed and new ones established, the manual system consumed enormous amounts of time, according to Richard G. Doiron, Ph.D., director of psychological services at Sweetser.

Recently, Doiron transferred the facts and files of his behavioral motivation program to the home's Cado Systems Corp. System 20/IV computer that was previously purchased to handle the organization's bookkeeping. The system has one CRT terminal, three floppy disk drives and a 150 char./sec printer.

In addition, the children's home has a second Cado system equipped with a 55 char./sec letter-quality printer that is the heart of Sweetser's fund-raising operations.

Special Needs

At the outset of his unique project, Doiron saw that while the Cado system would provide all of the multitasking capability he needed, there would have to be some additional and very specific programming to handle his program's needs. He met with systems analysts and programmers from Northern Data Systems of Maine, Inc., Cado's Falmouth-based representative, to build the project's programming backbone.

"As far as we could tell from our research, and as far as Sweetser could determine, no such behavioral application was in existence," Charles R. Stevens, president of Northern Data, said. "We had to design it from scratch with Dr. Doiron describing what he wanted to accomplish and our systems people figuring out ways to do it."

The computerized behavioral motivation program begins when a staff member sits down with a child to set three goals for the next week or two weeks, depending on the child. Rather than working with impossible, general ideals such as "I will try to behave," the program homes in on specifics like "I will make my bed before 8 a.m." From a list of 150 specifics, the child chooses three goals for the next period.

Goals are written into a contract, which is signed by both staff member and child. They are also noted on a weekly rating chart, and daily scores are given for each behavior. The system also allows for bonus and penalty points.

Program's Core

This point system is the core of the motivational program, and it is here that the computer does the heavy work. "Children need to know how they're doing on a daily basis," Doiron explained. "A week is a very long time. If they do badly one day, they need to know they can start fresh the next. The

points they earn are entered into a 'bank book' and they can spend them on dozens of activities; everything from a can of soda to a movie to time with a staff member."

Once a week, Barbara Wentworth of Sweetser's staff enters each child's total

'The scores are especially helpful in showing a big change. For example, if we see that a child who has been doing well for several weeks suddenly begins to turn in markedly lower scores, we can take a closer look to find the problem.'

score into the computer. Printouts with information on all children go to the school and various Sweetser staff members so they can have a quick reference to any child's overall performance. Printouts also list scores for the previous reporting period, which allows for an immediate comparison and alerts staff members to major changes.

"The scores are especially helpful in showing a big change," Doiron stated. "For example, if we see that a child who has been doing well for several weeks suddenly begins to turn in markedly lower scores, we can take a closer look to find the problem." The computer also converts the raw scores to percentages, offering another performance index.

Built-in Flexibility

Contracts are also entered into the computer. The program has a built-in flexibility which makes the weekly changes, as well as the personalized behaviors, easy to change. Behaviors are written in "stems" and any personalizing is simply added to the end of the stem. For example, the stem "I will watch my language" can be personalized to

"I will watch my language on the playground."

Once in the computer, the data from the behavioral motivation program can be retrieved in a variety of ways. A Sweetser teacher who wants a quick rundown of the current behavioral goals of her pupils, for example, can call up the information for her entire class simply by feeding in each child's student number.

Student numbers can also be used to pull out a long-term list of goals the child has already met, complete with scores expressed in points and percentages. The data also serves as a backup record in case children lose the "bank books" where their points are stored.

Long-Term Picture

Every six months, the computerized behavioral data is used to prepare graphs showing a child's long-term progress. The graphs become part of a comprehensive picture of the progress of each child.

The graphs developed from the computer data also make vivid illustrations for use in conferences with a child's parents, Doiron said, because the peaks and valleys of a graph can be so quickly grasped. "The computer data has become a key ingredient of the integrated life experience we try to offer," he added.

Finally, the highly specific goals of the motivation program and the idea of daily ratings play a significant role in easing relations between emotionally disturbed children and their parents. "When parents can deal with these specific behaviors, and deal with them every day, they avoid the blowups that come of simply expecting a child to 'be good.' By giving parents precise behaviors to focus on, we can help them gain perspective on the child's problems," Doiron said.

Speech Synthesizer Provides Standard, Custom Word Lists

PALO ALTO, Calif. — A speech synthesizer module that reportedly can accommodate both standard and custom vocabularies up to a total of 256 utterances has been developed by Telesensory Speech Systems, Inc. for small systems.

The Series III Speech Module consists of the firm's own speech synthesizer as well as

Series/1 Controllers Get Test Feature

ORANGE, Calif. — MDB Systems, Inc. has unveiled a feature that reportedly enables printer controllers to send a test pattern to the connected line printer (independent or computer operation), which verifies that the interface circuitry of the printer and controller are operating correctly and the interconnecting cable is not damaged.

Printest solves a problem for the system user who may have a self-testing feature on his printer, but has been unable to test the interface drivers, receivers and connectors, the vendor said.

The product was designed for the vendor's line of IBM Series/1 printer controllers having Centronics Data Computer Corp., Data-products Corp., and Data Printer-type interfaces.

It costs \$1,995, the vendor said from 1995 N. Batavia St., Orange, Calif. 92665.

vocabulary data memory, an on-board speech filter and an audio amplifier.

The unit's TTL-compatible I/O and +5V single supply are said to simplify interfacing the module to a microcomputer. The memory can be any combination of one or two 16K, 32K or 64K read-only memory (ROM) or programmable read-only memory (PROM) providing up to 128K bits, a company spokesman said.

The basic unit costs \$295 and is able to store approximately 100 seconds of speech in ROM memory for retrieval on command. With 16K of ROM, it costs \$320, with 32K of ROM, \$345 and with 64K of ROM, \$395 from 3408 Hillview Ave., P.O. Box 10099, Palo Alto, Calif. 94304.

TI-Mix Meet Set For March 8-11

AUSTIN, Texas — TI-Mix, the users group for Texas Instruments, Inc. users, will sponsor a conference March 8-11 at the Marriott Hotel in New Orleans.

The conference will feature 66 customer exhibits, 36 sessions, panel discussions, workshops and more than 100 individual presentations.

The conference costs \$120 per person with early registration and group discounts available. TI-Mix can be reached through P.O. Box 2909, M/S 2200, Austin, Texas 78769.

INTEGRATED

ABC Bundles HP-1000L

TAHOE CITY, Calif. — ABC Computers, Inc. is offering Hewlett-Packard Co.'s 1000L computer system bundled with ABC Business accounting software through its authorized dealer program.

The basic system is shipped with 128K bytes of memory that is expandable to 512K bytes.

The system includes the 1000L processor; 15M bytes Winchester; tape backup; video CRT terminal; high-speed printer; HP's RTE-XL multiuser operating system; and business applications from ABC.

The system costs less than \$20,000. ABC computers can be reached through Box 7529, Tahoe City, Calif. 95730.

Minis, Micros Get UPS Series

NUTLEY, N.J. — The first of the Mintaur series of uninterruptible power systems (UPS) for minicomputers and microcomputers has been announced by Nova Electric Manufacturing Co.

The 2.5 kVA system provides 125% overload for 15 minutes, 150% for one minute and 1,000% for five cycles via the solid-state transfer switch, the vendor claimed.

The system, which can be mounted in a standard 19-in. equipment rack, was also designed for use with process control systems, communications systems or as a portable power source.

The UPS is priced at \$4,275 from Nova Electric Manufacturing Co., 263 Hillside Ave., Nutley, N.J. 07110.

Mini Bits

Disk Interface Boards Out For ModulasOne Bus

EMERYVILLE, Calif. — A line of disk storage interface boards, reportedly fully compatible with the company's 6802- and 6809-based ModulasOne-bus modules, is available from Adaptive Science Corp.

The line consists of three modules: Module 750 interfaces the 5.25-in. Shugart 400 floppy disks drives; Module 1350 interfaces to the Shugart 9800 and equivalent 8-in. floppy disk; and the Module 1360 interfaces to the Micropolis 1220 Winchester hard-disk drive.

The 750 costs \$225, the 1360, \$230 and the 1350, \$325.

Adaptive Science Corp. is headquar-

tered at 4700 San Pablo Ave., Emeryville, Calif. 94608.

Dot Matrix Printer Offered By TEI for Small Systems

HOUSTON — A small systems dot matrix printer encased in a soundproof, wood-grain lowboy cabinet has been introduced by TEI, Inc.

The Model 3432 features up to 136-column printing at 150 char./sec., and 9- by 7-in. dot format to form 94 Ascii characters, including lowercase letters with descenders, symbols and double-wide characters.

Featuring bidirectional printing under microprocessor control, Model 3432 costs \$1,995 from 5075 S. Loop E., Houston, Texas 77033.

A PICTURE IS WORTH A THOUSAND WORDS.

Have you ever wondered: "How do I communicate information to my clients or business colleagues, and get the point across without giving lengthy explanations?" Your answer comes from Timberline Systems, Incorporated:

THE GRAPHICS PACKAGE.

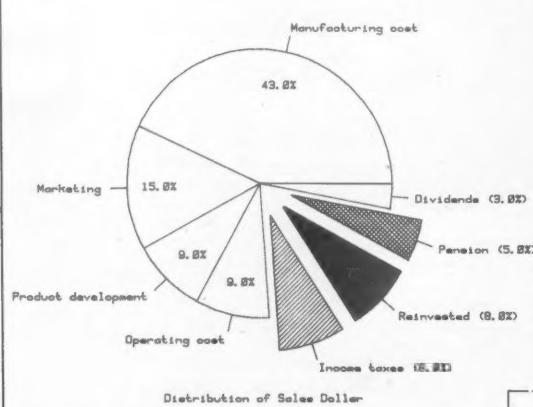
If your company has any model of the Texas Instruments DS990 series minicomputers using the DX10 Operating System, The Graphics Package from Timberline Systems will translate complex data into colorful, easy-to-read graphs. Just follow the step-by-step user's guide to plot, within minutes, your monthly sales figures on a vertical graph...or determine the distribution of overhead burden with a pie graph...or schedule jobs by generating a horizontal bar graph.

GRAPHS MAKE NUMBERS UNDERSTANDABLE.

The Software People® at Timberline Systems, Inc. have been developing people-oriented computer programs since 1971. Our new stand-alone Graphics Package integrates Timberline's flexible TI-based software with the reliable Hewlett-Packard plotters: models 7225A, 7220B and 7220S. Priced between \$4,000 and \$8,000 (depending on which plotter you choose), Timberline's Graphics Package is now available. IF WITHIN 30 DAYS YOU ARE NOT TOTALLY SATISFIED WITH YOUR NEW GRAPHICS PACKAGE, YOU MAY SEND IT BACK FOR A FULL REFUND.

ACME MANUFACTURING COMPANY

Fiscal 1979



LOOK AT THESE FEATURES:

Pie Graph

- up to nine shading patterns and 100 "slices"
- user may "explode" slices from pie
- automatic percentage calculation

Bar Graph

- up to 100 items (worded and/or numbered)
- up to five bars per item
- choice of vertical bars or horizontal bars
- choice of normal, stacked or comparative
- graphs can be zero-based or used for scheduling

Linear Graph

- up to five lines in eight styles (dashes, dots, solids, etc.)
- up to 100 coordinates
- choice of "scattergram" or connected points.

Graph Annotations

- add custom finishing touches to graphs
- can be used to create forms and text.

YES! Send me more information on your Graphics Package.

Please have a representative call for an appointment.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

(This reply coupon was generated by Timberline's Graphics Package using an HP 7225A plotter.)

FIND OUT MORE ABOUT THIS INCREDIBLE PRODUCT

Just fill out the coupon at right and send it to:

**Timberline Systems
Sales Department
10550 SW Allen Boulevard
Beaverton, Oregon 97005**

...or call toll-free, 1-800-547-1443.



The Software People®

Motorola Exorcisor I Gets Memory System

WESTLAKE VILLAGE, Calif. — A memory system designed for use with Motorola Corp.'s Exorcisor I, Exorcisor II and Rockwell International, Inc.'s System 65 has been announced by Chrislin Industries, Inc.

The CI-6800-2 memory is available in 16K-, 32K-, 48K- or 64K-byte configurations.

Its prices range from \$565 to \$750. Chrislin is at No. 102, 31352 Via Colinas, Westlake Village, Calif. 91361.

LSI-11, Versatec Gear Tied

SANTA CLARA, Calif. — Versatec, Inc. is offering a single-board interface that reportedly allows Digital Equipment Corp.'s LSI-11 microcomputer systems to use any Versatec electrostatic plotter or printer/plotter, input/output multiplexer, hard-copy controller or vector-to-raster converter. The Model 125 single-board interface provides for printing speeds up to 1,000 line/min and plotting speeds up to 34 sq ft/min, the vendor claimed.

The interface package costs \$1,600, the vendor said from 2805 Bowers Ave., Santa Clara, Calif. 95051.

COMPUTER INDUSTRY

IBM Net Up 18%, Revenues 14.7%

ARMONK, N.Y. — IBM's net earnings advanced more than 18% during 1980, reaching \$3.5 billion, while revenues grew 14.7% and topped \$26 billion.

Although earnings growth during 1980 was markedly better than 1979, pretax earnings grew 6.2%.

Commenting on the year's results, IBM President and Chief Executive Officer John R. Opel said, "A major factor in the increase in net earnings for the year and for the fourth quarter was the reduction in the effective rate for U.S. federal and non-U.S. income taxes."

For its fourth quarter IBM's revenues grew 14.3%, totaling \$7.8 billion, up from \$6.8 billion in the final quarter of 1979.

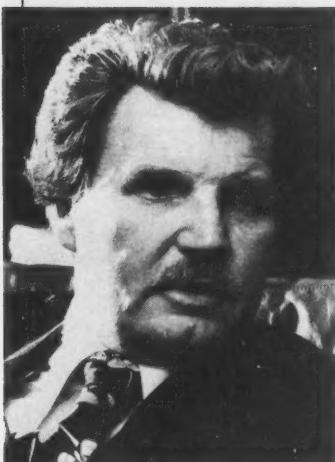
Earnings showed a 22.3% increase, rising to \$1.2 billion or \$2.11 per share, up from just over one billion or \$1.73 per share in the fourth quarter last year.

For fiscal 1980, IBM reported revenues of \$26.2 billion, up from \$22.8 billion for 1979.

Earnings jumped to \$3.5 billion or \$6.10 per share, a considerable gain from earnings of just over \$3 billion or \$5.16 per share last year.

"Purchases of data processing equipment was considerably higher for the year and the fourth quarter than in the comparable pe-

(Continued on Page 89)



Thomas M. Nies

**TI 785
745
743
765
820**



THE DATA TERMINAL AND SYSTEMS PEOPLE

DAS, the single source for trouble-free telecommunications. Nationwide.

With fully-stocked branch offices located from coast to coast, DAS, the nation's largest independent supplier of terminals, has the facilities and capabilities to provide instant, off-the-shelf delivery, sophisticated applications assistance, and super, on-site service at the lowest possible cost.

You save time and trouble with our free, 90-day warranty, available on over 45 state-of-the-art products from DEC, Diablo, Lear Siegler, H.P., Teletype. This unique protection plan covers not just the terminal, but every systems component we sell. So, whenever you need service there's only one reliable source to call. DAS' computer-dispatched technicians arrive on-site within one working day or less.

So, join the over 8,000 users throughout the country who depend on Data Access Systems, the single source for trouble-free telecommunications. For information on economical lease or purchase plans or details on a complete range of supplies call your local district office, or toll free: 800-257-0700, in N.J. 800-232-6510.

Data Access Systems, Inc.

Corporate Office:
Corte Rd. & Canden Ave.
Bala Cynwyd, PA 19004
(215) 228-7070
(215) 228-7747 • (800) 257-7748
in N.J. (800) 232-6510

District offices: Boston-(617) 709-6420 • Washington, D.C.-(703) 569-7711 • Philadelphia/De. Jersey-(215) 567-8315/(209) 854-0270 • Chicago-(312) 567-0460 • Los Angeles-(213) 538-4100 • San Francisco-(415) 592-5711 • Louisville-(502) 455-1402 • Atlanta-(404) 951-6404 • Minneapolis-(612) 944-5425 • Rochester-(716) 442-5750 • Houston-(713) 692-5905 • Dallas-(214) 256-5536 • Seattle-(206) 251-5070

Report Sounds PCM Alarm Over Changes Made by IBM In Software Support Policies

By Jeffry Beeler

CW West Coast Bureau

SAN JOSE, Calif. — IBM's latest moves to unbundle its operating systems and revise its software support policies have posed a serious new threat to plug-compatible mainframe (PCM) vendors, most of which still fail to understand the full implications of IBM's actions.

The threat to the PCM sector will prove especially pronounced for low-end and medium-scale processor suppliers such as Magnuson Computer Systems, Inc. and Two Pi Co., according to a recent study of IBM's large and mid-range systems strategy.

The study, which was released earlier this month by Strategic Business Services, Inc., traced the PCM vendors' potential difficulties to a recent but profound shift in IBM's software and program support strategy.

The change, which has been implemented in phases in the wake of IBM's 4300 series announcements, is characterized by several key developments:

- The unbundling of the industry giant's DOS/VS, IVM/370 and MVS operating systems.
- The imposition of severe restrictions on

the availability of local support to PCM mainframe users.

• The unbundling of local support involving on-site visits by IBM's Program Support Representatives (PSR).

• Creation of a Support Center for diagnosing and remedying program "bugs" over a toll-free phone line.

IBM's latest software unbundling marks perhaps the most significant shift in the company's operating systems strategy in more than a decade, the study said. Before the 4300 series announcements, the System Control Program (SCP) portion of the firm's operating systems was virtually free and incorporated most of the features critical to the software's effective operation.

Today, however, most of those key software features — including job entry, communications support, spooling, disk-systems management and the ability to accommodate multiple partitions — have been removed from the SCP and turned into Program Products (PP) for which all users are required to pay a monthly license fee.

The SCP's transformation from a give-away to a chargeable item promises to have

(Continued on Page 88)

Cincom's Philosophy: Innovation

By Marcia Blumenthal

CW Staff

CINCINNATI — Thomas M. Nies, president of Cincom Systems, Inc., likes to summarize the philosophy behind his company in one word: Innovation.

But Nies is not nearly as terse explaining how innovation has helped his software company progress to a \$40 million company since it was founded 13 years ago with \$600.

You can't win in this industry if you merchandise head-on with IBM, Nies stressed. "To survive in the market you have to be two to four years ahead of IBM's product introduction."

The foundation of Cincom's success is its Series 80 Total data base management system. Cincom was not the creator of the data

base concept, but "we popularized the idea back in the late 1960s and early 1970s," Nies said. At that time IBM was not merchandising a data base system.

Until 1974 or 1975 Cincom held about 80% to 85% of the data base market, he claimed. Today IBM and other independents have eroded Cincom's position, but Nies maintained Cincom still holds some 45% of the entire data base market and nearly 65% of the independent (non-IBM) data base market. Today there are 2,700 users of Cincom's Total system.

Communications Monitor

From popularizing data base Cincom continued its leading edge tactics by integrating

(Continued on Page 87)



Data Base Processor Not Visible In Cincom Systems' Future

By Marcia Blumenthal

CW Staff

CINCINNATI — Although Cincom Systems, Inc. considers itself in the vanguard of innovative software systems, a data base processor is not in the company's future.

Cincom President Thomas M. Nies said the data base processor is "an idea whose time has come and passed."

The bottleneck in processing data base applications is the

input/output function, Nies explained during a recent interview. The average time required to access a disk record is 50 msec, he said, noting that, in the time it takes to access one record, a system operating at 5 million instructions per second could process 250,000 instructions. Offloading the data base function, then, does not greatly improve processing efficiency, he maintained.

Now . . .

**IBM, HP, DG, DEC,
PRIME, APPLE
and others
have
something
in common.**

The INSTOR/80

an easy, reliable way of storing and exchanging data!



INSTOR/80, using IBM 3741—the world's most common and reliable floppy disk format, interfaces any computer, data entry or data capture system using an RS-232 port, thereby providing standard media.

A complete file management system is built in, no software development necessary. The directory, file structure, ASCII/EBCDIC conversion and much more are

automatic. Turnkey interfacing software available for most systems. \$3,995.00 complete. For further information, contact Dave Agerter, Sales Manager. Distributor and representative inquiries invited.

instor
CORPORATION
175 Jefferson Dr., Menlo Park,
CA 94025 (415) 328-9830

AGENTS WANTED FOR MANUFACTURING SOFTWARE.

Do you have hands-on experience with computerized manufacturing systems? Then together we can help improve America's productivity!

Our Manufacturing Resource Planning (MRP) systems are now available to manufacturers of defined sizes. For the experienced agent or systems house, we offer territories, a comprehensive marketing program and the best MRP software system on the market. Package includes complete and useable documentation and end-user education. Results will be measured on a quarterly basis against quota.

Please send company history and present product lines to Mr. Ross Trenholm.

**SOFTWARE
INTERNATIONAL®**

Elm Square, Andover, MA 01810
(617) 475-5040
OFFICES AROUND THE WORLD

**SELL FOR US.
WE'RE THE LEADER.**

Although Nies said he considers data base processors a "marketing ploy," his opinion, in part, may have been formed by the architecture of the company's data base management system, Total.

In general, a chaining system, such as Total or IBM's IMS, is heavily I/O-dependent because it chases pointers through a data base and must access each individual record, according to one industry expert. This type of system is generally more geared to updating files than ad hoc inquiries and therefore is more I/O-bound.

Software AG

However, Software AG of North America, Inc.'s data base management system (DBMS), Adabas, is built on an inverted list structure, which is oriented to questions and queries rather than updating, according to John Maguire, president of Software AG.

His firm introduced its Data Base Machine (DBM) last October, the first one commercially available to end users. [CW, Oct. 27]. The Britton Lee, Inc. system introduced last March is sold on an OEM basis to systems houses, which develop customized front-end interfaces for the machine.

At the time of the introduction of its DBM, Software AG said the system was designed to allow users to offload the DBMS function from the host to avoid "resource saturation." Based on an IBM-compatible processor from Cambex Corp., the DBM sells for between \$300,000 and \$400,000 and is said to improve transaction throughput by 25% over a DBMS running on a nondedicated system.

While Software AG has thrown its hat into the data base processor arena, Intel Systems Corp. abandoned the idea of a data base machine in late 1979. Prior to that time, Intel Systems through its acquisition of MRI Systems, Inc., was eagerly pursuing the data base processor route.

Like Adabas, Intel Systems' System 2000 DBMS has an inverted list structure and would be ideally suited to the data base processor concept, noted Kent Ochel, president of Intel Systems, a subsidiary of Intel Corp.

In reevaluating its approach to a data base processor, Intel Systems found the product would not be profitable enough to market.

Ochel said a data base machine is of limited use unless a major portion of a user's applications are devoted to data base. According to the com-

Cincom's Future Focus: Relational Data Structure

CINCINNATI — What does Cincom Systems, Inc.'s president see as the company's focus for the future?

One thing he sees, Thomas M. Nies said, is a relational data structure, which it will soon introduce. During the 1970s, people argued whether a hierarchical or inverted list structure was better, but "this is ridiculous, because some data structures are good for some applications but not for others," he contended.

Nies sees great opportunities in directory-driven systems, such as the company's Total Information System (TIS), a second-generation data base system. Under a directory-driven system, users' applications programs do not communicate directly with the data base management system.

Instead, the components of the system and a user's applications communicate through the directory. Eventually, using this concept the company may build a product that would allow simultaneous support of multiple data base systems.

A third near-term direction is increased emphasis on online systems such as Mantis, which has eliminated the batch processing portion of application development.

pany's estimates data base applications generally consume no more than 15% of a user's processing resources.

Intel Systems is still pursuing the easing of the data base overhead on the host system without resorting to a genera-

lized IBM-type system sitting on a back end. While Ochel would not be more specific, last March Intel Systems integrated certain features of the System 2000 with Intel's Fast 3805 semiconductor disk system [CW, March 17].

NOW THERE'S NO EXCUSE FOR NOT DOCUMENTING.

Introducing **THE ELLISYSTEM**.

You've read about it in the news and editorial columns of Computerworld.

Now David B. Ellis' practical, money-saving system for program documentation is available in an easy-to-use, checklist format handbook. It can literally save programmers and DP departments thousands of dollars worth of lost time.

THE ELLISYSTEM works because it creates the documentation on-line, as you go.

It saves the programmer time while he creates the program. It saves time later when he modifies it. And it saves enormous time when the program is transferred to someone else.

Computerworld summed it up in a 1979 editorial: "As David Ellis observes, with personnel costs rising each year it is increasingly important for managers to use techniques that can help their highly-trained, well-paid staffs to become more efficient and productive."

THE ELLISYSTEM works. Hundreds have been sold. Order yours today.

cash or money order Visa Master Charge
 American Express Card Number _____

1-3 copies \$24.95 each 4 or more \$19.95

Enclosed is \$_____ for _____ Copies of **THE ELLISYSTEM**.
Add 7% for sales tax and handling cost.

Name _____

Title _____

Company _____

Address _____

City _____ State _____

Zip _____ Phone _____

THE ELLISYSTEM. Computer documentation that works.
P.O. Box 2341, Rapid City, SD 57709.

Cincom's Philosophy: Concentrate on Innovation

(Continued from Page 85)

Total in 1971 with an on-line data communications monitor — Series 80 Environ/1. The company never would have competed as successfully against IBM's CICS if Environ had been introduced in 1978," Nies explained.

Still focusing on innovation, Cincom's newly introduced Mantis system, an on-line applications development system, has the capability of replacing Cobol, Nies maintained [CW, Jan. 19].

Nies thinks Cobol, now 20 years old, is in its dotage.

However, being early to market with products has had its thorny moments, Nies said.

"We sometimes have a problem getting users to see the correctness of a product; so in the first two or three years of a product's life we do conceptual selling."

Yet with 66 of the Fortune 100 Cincom users, Nies said the firm is now able to confirm its new product ideas by working closely with these sophisticated users.

Growing on the average of about 30% per year, Cincom's revenue for its current fiscal year should hit \$50 million, up from \$35 million last year.

Cincom is a privately held firm and Nies is not considering taking the company public — a route increasingly being favored by established software firms.

Stress on R&D

By remaining a privately held firm, Nies thinks it is easier to keep the company focused on research and development. While Nies agrees marketing and advertising are important, at this point he does not want to skew the firm's resources toward merchandising.

Right now 30% of Cincom's expenses are for R&D, and an equivalent amount is allocated to marketing and sales. During the past five years R&D expenses have grown 600% while revenues advanced 300%.

This stress on R&D and innovation has made the company's return lower than a typical software company's return, Nies disclosed.

However, Cincom derives its income in a way generally associated with hardware companies — through rental.

Status '81 Conference To Begin Its Circuit

PALO ALTO, Calif. — Integrated Circuit Engineering Corp. will present its annual conference, "Status '81 — A Report on the Integrated Circuit Industry," here at Ricky's Hyatt House starting tomorrow.

Subjects to be discussed at the two-day event include the worldwide business climate, a forecast of semiconductor production/consumption, key applications and trends and key technologies.

Attendees will receive prepublication copies of the firm's Status '81 book, the vendor said.

The Status '81 conference will also be held in New York's Travelodge International/JFK hotel Feb. 10-11. The conference costs \$195, the vendor said from 15022 N. 75th St., Scottsdale, Ariz. 85260.



CW Photo by M. Blumenthal
Dennis Yablonsky

Some 65% of the firm's users rent the software and 95% of new customers opt for this arrangement, noted Dennis Yablonsky, international sales manager.

Yablonsky credited this strategy as being instrumental in assuring Cincom's financial health.

Although the company's success is rooted to its Total and Environ/1 systems, Nies views these as the foundation of the company rather than its ultimate goal.

Over the past several years Cincom has built on this foundation by introducing facilitative products such as an on-line query and data entry systems. More recently the firm has added another layer to its product family by introducing applications packages, a manufacturing package and a financial system.

While bringing products to market early has been a key to Cincom's success, the firm is not adverse to acquiring product technology from outside the firm. Mantis was developed by a person not associated with the company.

And, Cincom's Epoch financial management system was developed by a Scandinavian company.

Multisystem Use

Although most of the firm's products are designed to be run on large IBM systems, Total can be run on 28 processors under 40 operating systems.

Through its Ventures Division, Cincom will adapt its products for other vendors' equipment.

For example, Cincom has adapted its Total system for NCR's VRX operating system and has adapted its data dictionary for some of Sperry Univac's systems.

These vendors do the marketing for Cincom and Cincom does the development, receiving a royalty fee from the vendor, Yablonsky explained.

As for the future, Nies is adamant about obtaining recognition from users that software is the investment portion of the budget, while hardware is an expense — the opposite of the view widely held today.

That view will change, though, Nies declared, as IBM will find it increasingly difficult to compete against the Japanese for hardware sales.

Consequently, IBM will step up its emphasis on software development, making Cincom's strategy of being two to four years ahead of IBM even more important during the 1980s, Nies noted.

GET ON TARGET IBM SYSTEM/3 USERS

ESP • Executive Secretary Package

ESP • EXECUTIVE SECRETARY PACKAGE

A sophisticated information retrieval system with on-line inquiry and report generator capacity. The "Boss" or his secretary can use this system easily and simply without the DP Manager becoming involved.



USER FUNCTIONS

- Select Sequence & Field • Column Priority
- Customize & Modify whenever needed
- Select File • Spacing • Headings
- Hands on Knowledge of CRT the only Prerequisite
- Design Own Screen Formats
- Accurate
- Simple
- Easy
- Fast

PROGRAMMERS FUNCTIONS

- One Time File Definitions
- One Time Field Definitions
- One Time Sequence Definitions

FEATURES

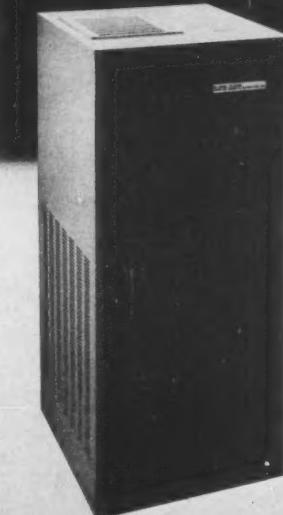
- Entire System On-Line
 - No Programming Required
 - Multiple Level Security Provided
 - Handles Multiple Record Types
 - No File need be Defined Under CCP
 - Design Screens are Stored in User Library
 - Add & Maintain Inquiry Without Shutdown
 - Sequences Derived Via SDSORT-ADDRQUT
 - Print Screen Image or Between Limits to 32K Printer
 - Inquiry Available Immediately — No Shutdowns - No DFSU
- * Cost: License Fee \$1900 or \$190/Mo. For 12 months

Retail Store Systems

FINANCIAL SYSTEMS & SERVICES
805 PLAINFIELD ROAD, SUITE 214
DARIEN, IL 60569 (312) 257-7890

A simple solution to ENVIRONMENTAL CONTROL FOR MINI COMPUTERS OR SMALL EDP CENTERS

Also, controlled office environments where cooling requirements are two tons or less.



- Slightly larger than a file cabinet.
- Can be positioned anywhere within the EDP room, even a corner.
- Controls temperature and humidity while filtering the air.
- Eliminates drafts and moisture problems associated with ceiling units.
- Front access to all components for easy maintenance.
- Quiet operation.

Data Mate is the newest member of Data Aire's complete family of environmental control systems from 2 to 50 tons.

DATA AIRE INC.

A CONSTRUCTION SPECIALTIES, INC. Company
Garden Grove, CA. (714) 891-3471

Systems and parts are immediately available at the following locations:
Cranford, N.J. • Toronto, Canada • Paris, France • Al Khobar, Saudi Arabia
Send for literature and specifications

Report Sounds PCM Alarm Over IBM Policy

(Continued from Page 85) as "dramatic" an industry impact as the firm's only other major software unbundling, which occurred in June 1969, the study predicted.

"Yet because of the gradual and somewhat 'sneaky' way in which the new unbundling was achieved, the public and the industry do not seem to have grasped its full significance," the report concluded. "It appears that the smaller

PCMs such as Magnuson, IPL Systems, Inc. and Two Pi will be severely impacted by the new software strategies."

Local Support

Another IBM product move that will likely have a profound impact on the PCM ranks is the recent unbundling of the industry giant's local support. Before the 4300 series' arrival on the scene, local support of SCPs was provided

free of charge to all IBM users and was available to PCM customers at the discretion of local IBM service offices.

Today, by contrast, local support of SCPs is available to IBM users only for a price and is no longer offered to PCM customers under any circumstances. Of course, PCM installations can still gain access to local support for all their PPs, but under IBM's revised service strategy, the company's PSRs are required only to make their "best effort" to correct bugs in a non-IBM user's licensed programs.

A third major IBM strategy change that casts a potential shadow over the PCM industry's long-term future is the recent formation of a Support Center that reportedly centralizes, streamlines and strengthens the firm's software-servicing capability. Many of the industry's other

vendors have recently tried to follow IBM's lead and establish Support Center-like facilities of their own.

But most of these IBM competitors, the study said, "lack the sophisticated, computerized problem-reporting and problem-tracking data base system, which is the backbone of the Support Center concept."

Challenging Future

IBM's triple whammy of unbundled operating system, tight restrictions on local support and the creation of a software Support Center means that, in general, the company's PCM rivals face a highly risky and challenging future. On the other hand, a few market forces will probably continue to work in the PCMs' favor.

One of the possible bright spots on the PCMs' business horizon is that IBM still suffers from unacceptably long delivery lead times, especially for its Model 4341.

Another "plus" on the PCM side of the ledger is the possibility that the unbundling of IBM's operating systems and local support could give rise to a whole new industry — the "third-party software maintenance field." The advent of such an industry would parallel the rise of the third-party hardware maintenance sector and would probably go a long way toward alleviating the PCMs' current software-support shortcomings, the report said.

Unfortunately for the PCMs, the emergence of a third-party software maintenance industry hinges on significant changes in IBM's existing software copyrights, the study added.

More information about the report is available from Strategic Business Services at Suite 215, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

Contracts

Mannesmann Tally Corp. and Commodore Electronics have reached an agreement for the supply of high-quality professional printers to be used on the CBM 8000 Series.

Planning Research Corp. has been awarded the initial \$15 million increment of an estimated \$20 million fixed-price subcontract by Burroughs Corp. for software support on its Air Force Phase IV contract.

Century Data Systems, Inc. has signed a renewal contract to provide 500 Trident Disk Drives to the minicomputer peripherals division of the Braegen Corp. over a two-year period.

Add total graphics capability to your computer



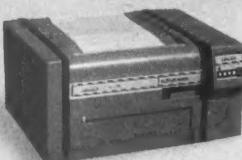
Different plotting, and printing applications often require different instruments. At Houston Instrument we're aware of your computer graphics needs. We listen to your evaluation and then recommend the plotter, printer, or plotter/printer that's exactly tailored to your specific application. Nobody else can do it, because nobody has such a broad selection of graphic output devices.

CØMPLØT® pen plotters are available in fourteen different models with X-Y plotter sizes of 8½ x 11" (DIN A4) or 11 x 17" (DIN A3) and drum plotter sizes of 11" (28 cm) to 42" (107 cm). Pen speeds range from 240 to 4,000 steps/sec. Prices begin at a low \$1,085.*



CØMPLØT electrostatic plotters and plotter/printers are available with models for printing (up to

2,400 lines per minute), plotting (up to 2" per second), or simultaneous plotting and printing.



CØMPLØT electrostatic CRT copiers provide fast, quality hardcopies from Hewlett Packard Series 2640 terminals or Tektronix® 4010 family terminals for just a few cents per copy. Prices for the Houston Instrument electrostatic products range from \$3,950 to \$6,550.*



Our Model 6000 TISPP (Thermal Intelligent/Strip/Plotter/Printer) allows superior quality graphics output from either an analog or digital source and provides

the continuity and clarity of a continuous trace with alphanumeric annotations under intelligent control. It's the versatile graphic output device for the new generation of microprocessor controlled instrumentation. Available in one or two pen versions. Prices start at \$1,795.*

When you think of hardcopy graphics, think of Houston Instrument. We offer you the best selection . . . the Houston way.

Examine our selection yourself by getting complete information and descriptive literature. Contact Houston Instrument, One Houston Square, Austin, Texas 78753, (512) 837-2820. For rush literature requests, outside Texas call toll-free 1-800-531-5205. For technical information ask for operator #5. In Europe contact Houston Instrument, Rochesterlaan 6, 8240 Gistel, Belgium. Phone 059/27-74-45. Telex Bausch 81399.

houston instrument
GRAPHICS DIVISION OF
BAUSCH & LOMB

- Registered trademark of Tektronix, Inc.
- Registered trademark of Houston Instrument
- U.S. domestic price only

IBM Reports '80 Earnings Up 18%, Revenues Up 14.7%

(Continued from Page 85)

riods of 1979. The volume of purchase activity in the fourth quarter was greater than had been anticipated earlier in the year," Opel observed.

"The favorable earnings resulting from high purchase volumes and the lower effective tax rate were diluted by continuing strong inflationary pressures."

IBM made a provision for income taxes for 1980 of \$2.3 billion compared to \$2.5 billion last year, a decrease of 8.1%.

Opel said that in spite of a tight economy, incoming orders and shipments

continued at high levels and showed moderate growth over 1979 levels, with the year-end backlog increasing over that of last year.

Sales of equipment totaled \$10.9 billion for the year, a 15.3% increase from 1979 levels. Revenue from rental and services reached \$15.2 billion for the year, yielding a 14.2% increase. The ratio of sales of total revenue was about 41.6%, relatively constant with 1979.

For the year the company experienced exchange gains of \$24 million compared to losses of \$52 million last year. The gains were primarily the result of the translation of assets and liabilities recorded in currencies other than the U.S. dollar.

Nickels & Dimes

Datapoint Corp. has announced a two-for-one stock split of the company's common stock, to be effected in the form of a 100% stock dividend. The stock split will be issued Feb. 6 to stockholders of record Jan. 16.

\$\$\$

Scan-Data Corp. has announced the conclusion of an agreement with Control Data Corp. restructuring the debt and equity arrangements between the two companies, whereby Control Data will own approximately 31% of the common stock of Scan-Data.

\$\$\$

Dest Data Corp. has completed a private equity placement totaling \$3.4 million. The proceeds of this offering are for the retirement of short-term debts and will provide working capital to finance company growth.

\$\$\$

Thomas Foley, president of Visual Technology, Inc., and Daniel Holland, president of the Massachusetts Capital Resource Co. (MCRC), announced MCRC's investment of \$1 million in the Andover, Mass.-based video terminal manufacturer.

\$\$\$

EG&G, Inc. has increased its quarterly dividend to 12.5 cents per share of its common stock. The increase, up from 10 cents, is payable Feb. 2 to stockholders of record Jan. 16.

\$\$\$

Comshare, Inc. has issued a common stock offering of 660,000 shares and has received net proceeds in excess of \$10.2 million. The shares sold for \$16.62 each.

\$\$\$

AW Computer Systems, Inc. has completed its initial public offering of 100,000 common shares of company stock, which comprise approximately 5% of the equity of that firm. The stock sold at \$4.00 per share.

\$\$\$

An investor group headed by Gerard Currie has recently completed an agreement with Centigram Corp. to provide \$1 million in funding to that organization.

NCR Net Rises 18.5%, Revenues 10.6% in 1980

DAYTON, Ohio — NCR Corp. reported a 10.6% increase in revenues and an 8.5% increase in earnings for fiscal 1980.

During the last quarter, revenues rose 9.8% to just over \$1 billion, up from \$987.8 million in the final quarter of 1979.

Earnings for the period grew 20%, reaching \$117.9 million or \$4.38 per share, up from \$98.3 million or \$3.67 per share earned in the comparable period of 1979.

For the entire year, NCR's earnings reached \$254.6 million or \$9.00 per share, up from \$234.6 million or \$8.78 per share in 1979. However, pretax income grew 4.4%.

Revenues for 1980 totaled \$3.3 billion, up from just over \$3 billion in 1979.

Commenting on the results, NCR Chairman William S. Anderson said the company's incoming business declined in the fourth quarter, compared with the year-earlier period.

"Based on current backlog and product availability, we are anticipating increased revenues and earnings during the early part of 1981. Results for the year as a whole, however, will depend to a considerable degree on business conditions in the U.S. and the extent of economic slowdowns elsewhere," Anderson said.

April 27/28/29
April 30, two special events
Hyatt Regency Chicago



The Productivity Company

Connections

DELTAK International Training Conference

Help your organization forge the link between information technology and increased productivity. Connect with the experts at Alvin Toffler, James Martin, Tom Lutz and many more!

Alvin Toffler — author of *The Third Wave*, examining the technologies that are triggering immense social and organizational changes in the 80s. **James Martin**, the DP industry's foremost lecturer and most widely read author, presenting innovative solutions to the acute problem of lagging application system development. And **Tom Lutz**, director of education for ITT's Software Technology Center, describing the tremendous contribution training makes to the human side of system development.

►►► Plus, concurrent sessions on 35 topics, featuring prominent industry experts like Jerry Fitzgerald, William Oncken and Dr. Charles Martinetz. Topics include Selling Management on Training, the User/DP Chasm, Office Automation and DP Operations Training. And on April 30, two special events — Training Managers Workshops and a Computer Based Training Forum.

Send me registration details about the DELTAK conference.

Name _____		
Title _____		
Company _____		
Street _____		
City _____	State _____	Zip _____
Phone _____		

DELTAK, Inc.

1220 Kensington Road
Oak Brook, Illinois 60521

Attn. Ms. Sharon Trube

12681

Burroughs Plans Expansion Of Component Operations

DETROIT — Burroughs Corp.'s Components Group is planning to expand its engineering and manufacturing facilities in Jacksonville and Coral Springs, Fla., by an additional 180,000 sq ft of plant capacity.

This will enhance the group's capabilities to produce power supplies, interconnection devices and other electronic components for use in Burroughs DP products, Burroughs said.

Burroughs will build a 100,000-sq-ft facility in Jacksonville on a 42-acre site it recently purchased in the Argyle Forest development. Current plans call for groundbreaking to occur during the spring of 1981 with occupancy scheduled for a year later. Approximately 300 engineering, manufacturing and administrative personnel will be employed.

In Coral Springs, Burroughs will construct an 80,000-sq-ft facility on a site which adjoins its present facility.

Groundbreaking will occur this month with completion scheduled for late 1981; ap-

Expansions

proximately 400 people will work in the new building.

Other Moves

Computer printer manufacturer Integral Data Systems, Inc., has moved its headquarters from Natick, Mass., to a newly constructed 60,000-sq ft building in Milford, N.H.

Visual Technology, Inc. has expanded its operations into facilities at 540 Main St., Tewksbury, Mass. 01876.

Megatek Corp. has enlarged its corporate headquarters in the Sorrento Valley area with the addition of 10,000 sq ft of space in an adjacent building.

Circle Computer Services, Inc. has recently opened an office in Tokyo, to extend its engineering and modification services to the Far East.

Chapman Named Counsel for CCIA

WASHINGTON, D.C. — John Haven Chapman has been appointed vice-president and general counsel of the Computer & Communications Industry Association (CCIA).

He will have responsibility for CCIA's pending appeal of the Federal Communications Commission's recent final decision in the Second Computer Inquiry.

Chapman was recently senior trial counsel with the U.S. Department of Justice's Antitrust Division in the U.S. vs. IBM antitrust suit.

Meet to Address Computer-Based Ed

CHICAGO — A national technology-assisted learning industry conference, "Interfacing Industry Components," will be held at the Holiday Inn/Mart Plaza here Feb. 19 and 20.

Sponsored by the Technology-Assisted Learning Market Information Service (Talmis) of Educational Programming Systems, Inc. of St. Louis, Mo., the program will address some of the concerns faced by firms currently participating in computer-based educational products and services, or planning to.

Besides a technological exhibition, the conference will feature 12 sessions. A fee of \$450 includes refreshment breaks and lunches for the two days, according to a spokeswoman at Educational Programming Systems, 1328 Baur Blvd., St. Louis, Mo. 63132.

Small Business Guide Lists Federal Contacts

SUFFERN, N.Y. — The 1981 Small Business Directory of Government Contacts listing 1,000 small business specialists within the U.S. Department of Defense and major ci-

CI Notes

vilian agencies has been released by the Danbury Press.

The 72-page directory, designed for small and minority businessmen, lists subcontract specialists in state as well as federal government offices by name, address and phone number.

The directory is available at \$15 per copy plus 75 cents handling from the Danbury Press, P.O. Box 613, Suffern, N.Y. 10901.

A companion manual *How to Get Started in Government Business*, is also available at \$25 per copy plus \$1 handling.

'Infosystems' Forms Committee for Meet

CHICAGO — *Infosystems* magazine has formed a Program Advisory Committee for its second annual Software Info Conference, scheduled here Sept. 14-17.

Robert V. Head, a federal executive fellow with Brookings Institute, will chair the committee, which is aimed at monitoring the overall direction of the program.

The Software Info Conference will be held as part of Infosystems National Software Package Conference & Exposition at the Merchandise Mart Expocenter here.

Medical Group Sets

Tour of Hanover Fair

BOSTON — The Institute for Medical Record Economics, Inc. is sponsoring a guided tour to the Hanover Fair in West Germany.

The tour leaves from Boston on the evening of March 28 and returns April 5. The cost, including air fare, accommodations, meals, workshop fees and admission tickets is \$1,980 per person.

Deadline for registration is Feb. 20 with the Institute for Medical Record Economics, Inc., P.O. Box 263, Cambridge, Mass. 02141.

Comdex/Spring Expo Slated for New York

FRAMINGHAM, Mass. — A Comdex/Spring conference

and exposition will be held in New York City in June 1981 at a date and site to be determined, according to the show's sponsor, The Interface Group.

The Comdex/Spring results from the large industry growth and will be held in addition to the Comdex '81 conference and exposition, already scheduled for the third year in Las Vegas Nov. 19-22.

Time and date for the new show will be announced soon. More information is available from Comdex/Spring, The Interface Group, 160 Speen St., Framingham, Mass. 01701.

Demos Planned For DEC Users

ORANGE, Calif. — The 1980 "DEC-Compatible Shows," a series of one-day product demonstrations for Digital Equipment Corp. users, has been extended for 1981.

The shows, which are sponsored by MDB Systems, Inc., will be expanded from this year's base of Pittsburgh, Washington, D.C., and Chicago to include Seattle, San Diego, New Orleans, Cleveland and Syracuse.

MDB is located at 1995 North Batavia St., Orange, Calif. 92665.

Amda Sets Locale, For 1981 Convention

SAN DIEGO — The 1981 convention of the Accounting Machine-Minicomputer Dealers Association (Amda) will take place here on March 18-22.

Amda is composed of approximately 150 independent equipment dealers located throughout North America. Last year, the group chose Diablo, Micro V Corp., Cado Systems and Commodore Business Systems to display their wares at its Toronto convention.

Admission to the event is \$55. Interested parties can obtain further details from Bill Keith at 85 Woodcrest Lane, Elk Grove Village, Ill. 60007.

Mergers/Acquisitions

Wespervorp has announced its agreement to acquire Data-systems Corp. in exchange for stock of Wespervorp. Consumption of the transaction is contingent upon Data-systems' shareholder approval.

The assets of Computer Applications Corp. have been acquired by Pioneer Hi-Bred International, Inc. for an undisclosed cash amount.

EG&G, Inc. and Chandler Engineering Co. have jointly announced that an agreement in principle has been reached for the acquisition of Chan-

dler Engineering by EG&G through an exchange of common stock.

RCA Corp. has completed the sale of its Avionics Systems business to Sperry Corp. The purchase price is \$44.6 million, subject to certain adjustments.

Intersil, Inc. stockholders voted to approve the proposed merger with SUBGE Corp., a wholly owned subsidiary of the General Electric Co.

Ampex Corp. has become a wholly owned subsidiary of Signal Cos., Inc.

AVAILABLE
3033-N8 2/20/81

TRANSCAPITAL COMPUTER CORPORATION

274 RIVERSIDE AVENUE 8150 LEESBURG PIKE
WESTPORT, CT 06880 VIENNA, VA 22180
(203) 226-8301 (703) 790-8210

For Lease Only
4331 J2, K2, L2

Available March, 1981

4341 K2

Available September, 1981

4341 M2

Available January, 1982

Also Available for 1981 Delivery

3880's 3370's

April

3380's 3375's

September/October

November



4480 North Shallowford Road / Atlanta, Georgia 30338 / (404) 394-9533

Executive Corner



Ursula F. Fairbairn

Fairbairn Named VP at IBM DPD

WHITE PLAINS, N.Y. — Ursula F. Fairbairn has been named vice-president in charge of the management services staff in IBM's Data Processing Division (DPD).

Fairbairn joined IBM in 1966 as an instructor in the New York Education Center. She served in a number of marketing positions until 1973, when she was appointed a White House Fellow and executive assistant to the U.S.

Secretary of the Treasury.

She returned to IBM in 1974 and was appointed to a number of field and headquarters management positions. In 1978, she was named executive assistant to the chairman of the board of IBM.

The following year, she became group director, product programs and practices, Data Processing Product Group, headquartered in Harrison, N.Y. Fairbairn is a graduate of Upsala College and received a Master of Arts degree from Harvard University.

Other Moves

- Edward M. Lee has been promoted to president of the newly formed Information Technology Group of Indian Head, Inc.
- Colin L.W. Baxter has been elected president and chief of operations at The Foxboro Co. and executive vice-president Charles A. McKay has been named to the board of directors.
- James Finke has recently been appointed president and chief operating officer at Commodore International Ltd. Jack Tramael has simultaneously been named vice-chairman of the board and chief executive officer.
- Robert S. Scheidemantel Jr. has been appointed president of Sweda International, a Litton Industries affiliate.
- Brigadier General H.R. "Johnny"

Supershorts

Stockholders of Microform Data Systems, Inc. have approved a change in the corporate name to Icot Corp., effective immediately. The Mountain View, Calif. firm manufactures communications processors, intelligent terminals and interactive micrographic systems.

The directors of the Institute of Electrical and Electronic Engineers have elected Dennis J. Picard a fellow, the highest grade of membership in that professional society. Picard is a vice-president of Raytheon Co., in the equipment division in Wayland, Mass.

Shugart Associates has signed an agreement licensing Flexidisk Technologia Electronica S.A. to manufacture and market its floppy disk drive products in Brazil.

The National Computing Centre Training Library of England has been selected by Sperry Univac as a means of standardizing their customer training programs in systems analysis throughout the world.

Symbol Technologies, Inc. has recently formed an overseas subsidiary, Symbol Technologies International, in Brussels, Belgium, to handle the European demand for bar-code scanners.

Consumer Computer Marketing, Inc. (CCM) has signed an 18-month marketing contract with Cromemco, Inc. under which CCM will serve as

Johnson, USAF (retired), has joined Vitalink Communications Corp. as a founder, with duties of a senior vice-president of marketing.

- Frank J. Iazzetta has been named vice-president of marketing for International Memories, Inc. He joined the firm from Century Data Systems.
- Bruce D. Smith has been elected vice-president of planning and new ventures of Comsat General Corp.
- Paul Ebeltoft has been appointed vice-president of sales for Bowne In-

formation Systems, a computer text processing services firm.

- Patrick E. Elmendorf has been named vice-president of operations of Corvus Systems, Inc.
- Perry G. Constantine, formerly of Fairchild Camera and Instrument Co., has been named vice-president of marketing for Eaton Corp.'s semiconductor equipment operations.
- Dave Stallard has been appointed vice-president of engineering at Zentec Corp.

If you're confused about computer power conditioning, you should be!

In a power conditioning market that is hot and getting hotter there are several competing technologies all making strong (and often exaggerated) claims of "total protection," "complete effectiveness" and "99.5% clean power."

Inexpensive transformers and regulators at best offer minimal protection, and the costly UPS delivers a level of stand-by power conti-

nuity that is rarely if ever needed.

Only the Atlas UPC/Uninterruptible Power Conditioner combines the ride-through of a UPS with the unquestionably superior power conditioning of a motor-generator to provide truly comprehensive power protection at a very affordable price. And



only Atlas can assure the end user of making the right choice with this written guarantee.

The Atlas UPC must provide 100% clean computer power regardless of utility problems and line disturbances or the purchaser may return the equipment for a full refund.

Write or call for more information including power technology comparisons and detailed UPC literature.

ATLAS
ENERGY SYSTEMS

Home Office: 9457 Rush Street, South El Monte, CA 91735 Phone (213) 575-0755
Regional Centers: Boston (617) 492-2525 Chicago (312) 372-2757



POWER SYSTEMS FOR COMPUTERS

PILLER

POWER SYSTEMS FOR COMPUTERS

Quiet, reliable 415 Hz and 60 Hz power for your CPU and peripheral equipment. Computer-grade diesel electric standby power, too. That's what's made ours the first name in power for computers, with more than 2,000 Piller installations worldwide. Want to know more? Call Murray Lazar, Director of Marketing (914) 355-6741. Talk to the leader.

KW CONTROL SYSTEMS, INC.
South Plank Road, Middletown, New York 10540
Phone (914) 355-6741 TELEX No. 13-7428

Apple Computer, Inc. has announced a computer literacy program, named "Apple Seed," which will provide certain elementary and high schools with computer course materials. The new program will be launched in February in the U.S. and Canada.

BASF Systems, formerly a division of BASF Wyandotte Corp., has become a separate entity within the BASF Group. Its new name is BASF Systems Corp., and it will operate as a wholly owned subsidiary of BASF America Corp.

The Data Products Division of R.H. Cole Electronics Ltd. has been acquired for more than one million pounds by Codex Corp. and Motorola Ltd., two wholly owned subsidiaries of Motorola, Inc. It is now called Codex U.K. Ltd.

A 14-member Honeywell Technology Board has recently been formed to coordinate, plan, fund and execute solutions to pervasive technology issues companywide.

Trend Communications Ltd., a \$20 million subsidiary of the Phicom Group, a U.K. firm, has announced that it is changing the name of its recently acquired U.S. peripherals company, the Drillick LaManna Corp., to Trend-DLC, Inc., effective immediately.

position announcements

position announcements

position announcements

position announcements

position announcements

Position Announcements

IDMS

San Francisco Bay Area

Our client, a large international organization headquartered in the SF area, needs a top-notch professional to fill the position of IDMS DB/DC Specialist to provide technical leadership in the design of the data base for their management information system. The successful candidate will have demonstrated competence in the following areas: IDMS, DB/DC in a CICS environment, 3-5 years experience in designing IDMS databases in an on-line environment, and excellent communication skills. The position offers excellent opportunities for personal growth and financial rewards, as well as outstanding benefits and working conditions. We are consultants to management. For immediate and confidential consideration, send resume and salary history to Clasy VanBalen, Professionals for Computing, Inc. (Search & Personnel Services), One Maritime Plaza, Suite 1350, San Francisco, CA 94111. (415) 956-7120. Employer assumes fee.

PROGRAMMING CONSULTANTS \$12-25/hour

Long Term Assignments

COBOL, PL/I CICS, TSO

H 6000, DM-4

HP 3000, COBOL

Contact:
Karen Romano
(617) 273-4240

digital arts group

Contract Services Div.
50 Mall Road
Burlington, MA 01803

PROJECT MGR. CENTRAL MASS.

Well-established fin'l. services co. has an opportunity for goal-oriented & systematic mng. to implement major new sys. IBM 3033 OS/MVS, COBOL environ. Must have strong user liaison skills. Will direct small but growing prof. staff. Rural country setting. Salary \$33,000 (fee paid). Contact Gerry Battista.

Robert Half of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200
Personnel Consultants



DALLAS...the best computer career lifestyle in the U.S.A.

SALARIES TO \$35,000

Since 1970 we have specialized exclusively in the successful counseling, representation, and career advancement of hundreds of computer professionals like yourself. In Dallas, our clientele consists primarily of every major data processing installation as well as numerous smaller organizations. Current opportunities exist for:

- * Programmer/Analysts: COBOL, ALC (BALI, RPL, PL-1, FORTRAN)
- * System Programmers: IBM DOS, VM, OS/VSE, SVS, MVS, CICS, IMS, TP, Data Base.
- * Mini Computer Programmers
- * Software Engineers

To inquire about hundreds of Dallas and thousands of national career opportunities, send your resume or call us today! Fees paid by client companies.



DataPro
DATA PROCESSING PERSONNEL CONSULTANTS

5500 LBJ FREEWAY - SUITE 650-C
DALLAS, TEXAS 75240 (214) 661-8600
Member of National Computer Assoc.

Data Processing:

DOS/VS (6) specialist wanted at fast-growing VCI in Cherry Hill, NJ (suburban Philadelphia).

Your internals, sysgen, and Assembler Language experience (macro a plus) qualify you for this rewarding new position involving a large-scale developmental project.

Value Computing, Inc. (VCI), is a leading proprietary software company offering data center management, tape library management, and computer utilization and chargeback packages. • We're well-established and growing fast...and we offer challenging assignments, excellent salary, and benefits that include an employee stock ownership plan.

If you feel qualified, please send your resume, with salary history, to: Mr. Gene Moore, Manager of Design & Development, VCI, Inc., 498 Kings Highway, Cherry Hill, NJ 08034. We're an equal opportunity employer.



PROGRAMMERS and PROGRAMMER ANALYSTS

We are a national recruiting firm searching for career-oriented systems programmers and programmer analysts with experience in a large scale IBM environment or on DEC minicomputers. We have immediate opportunities nationwide including many concentrated in the South. We need applications in manufacturing, finance and business. For selective handling without pressure, mail your resume to: Jim Reed, Atlantic States Personnel, P.O. Box 9928, Savannah, Georgia 31412 or call collect (912) 232-0226. All fees and relocation paid.

Lockheed Shipbuilding and Construction Company Offers New Employment Opportunities In Seattle, Washington

As a wholly owned subsidiary of the Lockheed Corporation, we can offer an exciting challenge for you in one of the country's most beautiful and appealing areas.

Why Washington?

Washington State has over one hundred state parks, seven national forests, two major mountain ranges, and a seemingly endless assortment of lakes, rivers, reservoirs and beaches. These resources make our state a prime area for uncrowded skiing, hiking, camping, fishing and other outdoor activities. The mild climate makes many of these activities practical on a year round basis.

Why Seattle?

Seattle offers a unique blend of business, culture, and sports activities. One of America's "most livable cities," Seattle is located between the Olympic and Cascade Mountains on the shores of Puget Sound. It offers clean fresh and salt water activities, over 400 parks, two large lakes within the city limits, magnificent scenery, theaters, museums, restaurants, excellent schools, "old fashioned" real estate values and eight professional sports teams.

Why Lockheed?

The largest industry in the area is transportation products. Lockheed is well known and respected in that category. The shipbuilding industry in Seattle is well established, and has excellent growth potential. Recent federal government and U.S. Navy contracts have guaranteed Lockheed Shipbuilding and Construction a prosperous future.

Senior Information Systems Analyst Programmer Analyst-COBOL

Excellent fringe benefits include company paid medical, dental, life insurance and retirement plans, holiday and vacation benefits and savings plan.

For immediate consideration, send your resume or letter with salary history to Personnel Department, 2929 16th Ave. S.W., Seattle, WA 98134. Telephone (206) 292-5604.

LOCKHEED Shipbuilding and Construction Company

We are an equal opportunity employer m/f

WHY CHANGE JOBS?

Excitement is only one reason. Now available, new positions with our firm's growing computer department - management, programming, support staff - expanding 500% yearly. That's exciting.

Hewlett-Packard and Burroughs have said we are producing one of the world's most innovative control, structure, design and software systems in the world. Now, that's exciting!

Our people stay. Why? Because they're excited! HP and Burroughs experience qualify you for a move to our dynamic multinational firm, located in beautiful Marin County, California, away from the "pack."

Why change jobs? To become part of the best, to challenge yourself, to enjoy the job satisfaction you deserve. If you have an independent, creative mind, we have one question: won't you join us? Contact:

Gary Nelson
& Associates Inc.
PO Box 4370
San Rafael, CA 94913
(415) 478-5101

DOS/VS(E) SUPERSTARS

APPLIED DATA RESEARCH is seeking DOS/VS and VSE system software specialists to develop a wide variety of advanced software products. Top salaries, state-of-the-art projects, and excellent growth opportunity. Outstanding environment for those who want a challenging career. Reply in confidence to:

Director, Software Products Division

APPLIED DATA RESEARCH, INC.
Route 206 and Orchard Road, CN-8
Princeton, New Jersey 08540

An Equal Opportunity Employer m/f/h/v

ADR

position announcements

position announcements

position announcements

position announcements

position announcements

GET AN EDP JOB ANYWHERE

CALL FREE
0-612/338-6714
CALL COLLECT

Analysts, project leaders, programmers with more than a year's experience let us help you find a better job. For a decade we have been placing EDP professionals like you all over the country through our network of 26 national offices. Send your resume or call

Electronic Systems Personnel
858 TCF Tower, 121 So. 6th Street
Minneapolis, MN 55402
client companies assume our fee.

EEP
EDP Placement Specialists
A Member of National Computer Associates

IMS DATA BASE CONSULTANT

San Francisco

To \$38K

Our Bay Area client has an immediate opening for IMS Application Consultant. Position requires 5 years experience in data processing with a minimum of 3 years experience in architectural design, application program support, working with productivity aids. Duties include performing tuning, standards/procedures and exposure to internal. Relocation expenses will be paid and an excellent benefits package is included.

We are consultants to management. For immediate consideration, please call or send resume and salary history, in confidence, to Gary Schultz, One Butter St., Suite 1001, San Francisco, CA 94104. (415) 382-3770. Employer assumes fee.



COMPUTER PLACEMENT CONSULTANTS

HOUSTON

Houston means growth, especially for talented DP professionals. Good IBM DOS/VSE - OS/MVS skills are needed in Houston NOW!

Programmers	\$20-\$28,000
Prog./Analysts	\$22-\$28,000
Analysts	\$24-\$30,000
Proj. Leaders	\$25-\$32,000
IMS DBA	\$26-\$35,000
Sys Programmers	to 40,000

Small to large Fortune 500 companies. Good benefits plus liberal relocation.

Call JIM FLEMING at 713-688-1800 or send your resume to:


ROBERT HALF OF HOUSTON, INC.
720 N. Post Oak Rd., Suite 228
Houston, Texas 77024
PROGRAMMERS AND ANALYSTS**Free Employment Service****Northeast, Southeast & Midwest U.S.**

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support.

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees.

RSVP SERVICES, Dept. C,
Suite 200, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES
Employment Agency for Computer Professionals

RSVP SERVICES, Dept. C,
Suite 300, Dublin Hall
177 Walton Road
Blue Bell, Pennsylvania 19422
(215) 629-0593

RSVP SERVICES
Employment Agency for Computer Professionals

Computer Professionals Hardware/Software

At General Electric we're using computers in ways no one thought of before.



Creating new applications of technology.

Applying it to GE products, businesses, operations and services.

Few other corporations are involved in programs of such breadth and diversity.

Our commitment to computerization has already made GE one of the world's largest users of computer technology. And this commitment continues to expand.

The computerization of GE has scored notable successes in a wide range of areas:

medical care... transportation... aircraft engines... spacecraft... electronic controls... process automation... mobile communications... energy... computer aided design and manufacturing... automated assembly... industrial robots... information processing... financial services... optical scanning... automated testing equipment... and this barely hints at our scope.

CAREER OPPORTUNITIES

at many U.S. locations are steadily being created for degreed computer hardware and software professionals with virtually every type of experience.

Access these now. Send one resume to:

Roger T. Sobkowiak, Manager
Computer Manpower Development
Bldg. 30EE, Room 48B
1285 Boston Avenue
Bridgeport, CT 06602

An Equal Opportunity Employer

Applying computers to make our most important product: Progress

GENERAL  **ELECTRIC**

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because people don't know what they want to do with their lives. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call Keith Reichle, Data Processing Specialist.

Dunhill

One Fairview Plaza, Suite 406
5950 Fairview Road, Charlotte, NC 28210
(704) 554-8771

A BETTER WAY OF LIFE

JOIN THE LEADING EDGE
OUR CLIENTS, the leading national and international corporations offer outstanding career opportunities, latest state of the art technology, nationally competitive salaries and the finest fringe benefits available in highly attractive Southeastern locations. More than 150 openings from \$16K-\$35K for:

ANALYST + PROGRAMMERS
with a minimum of 2 years experience in:
COMMERCIAL APPLICATIONS
SCIENTIFIC PROGRAMMING
SYSTEMS & UTILITIES
TECHNICAL SUPPORT
PROCESS CONTROL

WE ARE PROFESSIONAL RECRUITERS

Our client companies pay our fees and your interview and relocation expenses. NO CONTRACT TO SIGN! Your inquiries and our references are CONFIDENTIAL. For further information about your Southeastern potential, call TOLL FREE 1-800-334-0815 or write (include current resume, salary and objectives)



personnel consultants

P.O. BOX 6788 • GREENSBORO, N.C. 27405

position announcements

position announcements

position announcements

position announcements

position announcements

CULLINANE

CULLINANE DATABASE SYSTEMS, INC., the industry leader in computer software, has an unparalleled record for vendor support, systems enhancement and new product development. We are the most financially successful software company in the nation, and our performance in terms of growth and earnings has been consistently the highest (as reflected by a greater than 44% increase in revenue and profits this past year). Cullinane Database Systems provides the challenge and environment required by the skilled software professional.

If you are among the many professionals who are looking for the visibility and recognition that a growing company can provide, you may be interested in some of the new positions our growth has created.

SOFTWARE DEVELOPMENT/Database Software — Development and enhancement of our database management software packages.

Requires minimum 3 years' experience in database, data communications, data dictionary or query systems.

SOFTWARE DEVELOPMENT/Audit & Retrieval — Development and enhancement of our Audit & Retrieval software packages.

Requires strong Assembler & COBOL experience and IBM systems background.

APPLICATIONS PROGRAMMERS — Responsible for varied programming functions within our banking or manufacturing applications groups, some customer interface, and assisting in documentation preparation.

Requires 3-5 years experience as COBOL programmer or analyst; banking or manufacturing applications background essential. IBM experience and familiarity with IDMS or other database preferred.

TECHNICAL SUPPORT/Headquarters — Provide telephone support to customers in resolving technical problems.

Requires 3-5 years' experience as systems programmer in either VS or MVS environment. Strong Assembler language and VTAM/BTAM background essential.

QUALITY ASSURANCE TECHNICIANS — Responsible for the audit and testing of new systems, documentation and procedures in conjunction with new product development.

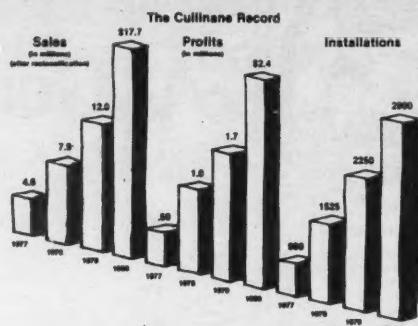
Requires minimum 2 years' programming experience; strong Assembler or COBOL skills; database or data communications experience required.

TECHNICAL WRITERS — Develop new and user documentation including operations manuals, summary descriptions, etc., as well as maintenance and enhancement of existing documentation.

Requires at least 2 years' COBOL experience as software technical writer. Background in programming and IBM systems knowledge desirable.

Cullinane Database Systems, Inc. offers a fully-paid employee benefit program including a Revenue Sharing Plan. If you qualify for any of the above positions, please send your resume including salary history to:

An Equal Opportunity Employer



COURSE DEVELOPERS — Responsible for the development of product-related education courses and training programs.

Requires strong communication skills; background in education and previous experience preferred. Familiarity in computer/training software environment desirable.

SALES REPRESENTATIVES — Requires proven success in software sales to users of medium/large scale IBM compatible equipment; technical background essential. Data communications and/or database management systems exposure desirable. Positions available in several regional territories.

INTERNATIONAL FIELD SUPPORT — Install products, interact with marketing reps to conduct training classes, provide on-site support to current and prospective customers.

Requires medium/large IBM mainframe and various O/S background. Three years minimum experience in programming, data communications or database administration. Multi-lingual individual preferred. Minimum 35% international travel required.

TECHNICAL FIELD SUPPORT — Install products, conduct training classes, provide phone and on-site support to current and prospective customers.

Requires medium/large IBM mainframe and various O/S background. 3 years minimum experience in programming, DC or DB administration. Positions available in Philadelphia, Chicago, Dallas, Palo Alto, Seattle, and New York.

Margaret E. Collins
Personnel Manager
Cullinane Database Systems, Inc.
400 Blue Hill Drive
Westwood, MA 02090
(617) 329-7700



Database
Systems

Cullinane Database Systems, Inc.

YOU BET CLIMATE IS EVERYTHING!

We don't mean just Sun Belt temperatures. We also provide the right climate for your climb to success. Because it's everything to us too.

• STAFF EXPANSION 1981 •

Our bank and its subsidiaries have now grown to 4 data centers, 950+ D.P. employees, 7000 total employees in a 200+ branch banking environment. Our equipment ranges from 370/135 through 3033 & 4341.

Let's Discuss Sunny Climes and Climbs.

Call Rich, Mike or Sue at (602) 261-1591 collect. (No agencies please) or mail your resume to:

VALLEY NATIONAL BANK OF ARIZONA
Attn: Sue Felsch
P.O. Box 71 CW10 A301
Phoenix, AZ 85001

an equal opportunity employer m/f



WHEN WHAT YOUR CAREER NEEDS IS BETTER DIRECTION

Direct your career to the right position anywhere in the USA

Botal Associates offers over 10 years of specialized DP placement expertise and much more. A unique computerized "Job Bank" maintains up to the minute job opportunities in your local community, as well as on a national basis. Fees paid by client companies.

If you have 1 year or more experience send your resume or call:

Botal Associates, Inc.
405 Lexington Ave
Suite 3100
New York, N.Y.
10017
(212) 687-0906

THE EASIER WAY

Member of National Computer Associates

DP PROFESSIONALS

Advance your career in the location of your choice!

If you have a minimum of 1 year of experience, call collect (or send resume) to:

Ann Barker

DEALY ROURKE PERSONNEL
1908 West End Bldg.
Suite 121
Nashville, Tenn. 37203
(615) 329-1771



Systems Consultant

Denver or Seattle

National consulting firm with offices in Denver and Seattle seeks experienced consultant to work with small to medium sized businesses on a variety of

challenging assignments. Our firm is owned by over 100 CPA firms nationally, and provides their clients with technical, management, and training services in data processing, financial accounting and general organizational development.

To qualify, you need previous consulting experience including automated and manual accounting systems. MBA or CPA preferred. Send resume in confidence to: 301-116th Avenue SE, Suite 450, Bellevue, WA 98004 or call (206) 454-8283.

An equal opportunity employer.

MANAGEMENT DESIGN ASSOCIATES

position announcements

position announcements

position announcements

position announcements

position announcements

Some computer companies seem to keep software groups isolated—even pit them against one another.

At Wang, we cooperate. No matter which group you're in, no matter what

project you're working on, we always encourage interaction. Because that's how great ideas happen.

We also offer high career visibility and plenty of personal freedom, plus day-to-day advantages like unlim-

ited computer time, your own terminal, generous work space, and more.

All because we realize that to have the best software in the industry, we need the best software developers. And the happiest.

The functions described below are just a few of the areas where opportunities exist.

At Wang, no software group is an island.


WANG
Making the world more productive.
©1980 Wang Laboratories, Inc., Lowell, MA 01851. We are an affirmative action employer.

Systems Software Development.

DATA COMMUNICATIONS

At Wang, you'll get a chance to put your best new ideas to work and see them turn into real products.

New data communications capabilities are currently under design for our VS computer system. The Wang VS provides highly advanced interactive and batch data processing capabilities and hosts Wang word processing, the world's most popular CRT-based word processing.

As a principle contributor, you will be designing and implementing new data communications capabilities for gateway access to SNA and X.25. You'll also develop VS networking for distributed processing and remote terminal communications.

A proven record in data communications product development as well as skills to coordinate and implement new products is required.

VS FIRMWARE

If you enjoy the challenge of working with state-of-the-art micro-processors and advanced computer peripherals while using advanced systems programming techniques, and you are capable of planning and implementing new systems by working with hardware engineers and other systems programmers, we have opportunities for you.

Wang has open positions for the research and development of intelligent I/O subsystems, data base machines, graphic displays, voice/speech processing, image printing and data communication such as broadband coaxial links and fibre optics.

For more information, send a letter and/or resume to Sue Morse, Wang Laboratories, Dept. CW-119 One Industrial Avenue, Lowell, MA 01851.

| position announcements |
------------------------	------------------------	------------------------	------------------------	------------------------

IS THERE A TECH SUPPORT PROFESSIONAL IN THE HOUSE?

There are Tech Support Analysts, then there are Bank of America Tech Support Analysts. The processing window at our San Francisco Data Center is so tight, that our nine IBM mainframes must be as dependable as a heartbeat. And it takes a special kind of professional team to monitor this heartbeat: Bank of America Tech Support Analysts.

This team of experts work together to troubleshoot the entire data processing system and keep it on the air. Our San Francisco Data Center utilizes seven 3033's running MVS REL 3.8, JES3 REL 3, IMS and batch twenty-four hours a day, seven days a week, plus two 168's utilizing VM and an Amdahl 470/V8 utilizing NCSS-VP.



You'll meet these demands with 12-hour shifts for three days on, then de-pressure with four days off. And what a four days you can have in the San Francisco Bay Area. Take a long tour of the Wine Country. Or ski at Lake Tahoe.

In addition to top-level challenge, state-of-the-art technology and an enviable location, Bank of America offers incredible computer resources and multiple career paths. We'll keep you in opportunities throughout your career. You'll also receive an excellent salary and benefits package.

To meet this challenge, your background should include experience in one of these three areas:

Operating Systems Software – three years of MVS JES2/JES3 on



system 370/158 and larger processors plus solid knowledge of MVS, JCL, IBM utilities and MVS externals; knowledge of IMS, VSAM, RESOLVE and IBM 3705 or Memorex 1270 transmission control units is preferred.

Field Engineering – two to five years experience in maintenance of large IBM mainframes or PCM's.

Computer Operations – five or more years experience operating large mainframes running under MVS JES2/JES3 operational knowledge of IMS, VSAM, RESOLVE and IBM 3705 or Memorex 1270 transmission control units is preferred.

The demands are great. But so are the rewards. If you can meet the challenge of being on call for Bank of America, please send your resume and salary history to us c/o B. Roe, Dept. 3411S, P.O. Box 37000, San Francisco, CA 94137. We are an equal opportunity employer.

BANK OF AMERICA 

BANK OF AMERICA NT&SA
MEMBER FDIC

UNIVERSITY OF CALIFORNIA AT IRVINE FACULTY POSITIONS IN COMPUTER SCIENCE

The Department of Information and Computer Science expects open faculty positions at tenured and non-tenured levels. Preferred fields of research interest are Computer Architecture, Theoretical Computer Science, Software and Software Engineering, Social Analysis and Social Impacts of Computing, and Artificial Intelligence.

Duties include research, teaching graduate and undergraduate courses, and participation in Departmental governance. Applicants must have Ph.D. or equivalent at the time of appointment. Applicants for tenured appointments must have significant research achievements and demonstrated competence in teaching. Opportunities for visitors for 1, 2, or 3 quarters of the 1981-82 academic year will also be available.

Affirmative Action/Equal Opportunity Employer
Send resume and names of three references to:

Julian Feldman, Chairman
Department of Information and Computer Science
University of California
Irvine, California 92717

To insure consideration apply by 1 March 1981

PROGRAMMER ANALYSTS GROWING

NCR INSTALLATION

One of world's leading Mid-East heavy equipment distributors offers exceptionally rewarding opportunities for qualified, experienced Programmer/Analysts. V-8400/V-8500 Computers using VRX-total-tranpro. Salary scale:

\$25,000 — 32,500 PLUS

America's company furnished housing, car full moving services. Liberal leave, holiday & air ticket policy provides opportunity for frequent exotic vacations. Bachelor status or \$5200 married unaccompanied allowance. Accompanied status and child education assistance available to university graduates after probationary & residency requirements are met. Renewable 2 yr contract provides career opportunities. Location: Jeddah, Saudi Arabia. Dynamic Cosmopolitan Red Sea city Reply to:

C.W. Box #3476
375 Cochituate Rd., Rte. 30
Framingham, MA 01701



Pacific Northwest
Washington • Oregon • Idaho & Alaska

Programmers • Applications Development • System Analysts • Compiler Designers
Sales/Marketing Reps • EDP Auditors • DB/DC Specialists • Operators CPU/DE/WP
Technical Support • Managers

Combine your D.P. career with the Northwest lifestyle. Explore D.P. opportunities by calling collect, sending resume, or drop in. **OUR CLIENTS PAY ALL FEES**

ROBERT HALF
EDP SEARCH SPECIALISTS

Portland, OR. • Bob Clawson • (503) 222-9778 • One S.W. Columbia, Suite 650 • 97258
Seattle, WA. • Ray Magill • (206) 624-9000 • 1301 5th Ave., Suite 2626 • 98101

COMPUTER OPERATORS

Evangelical Christian Ministry seeks qualified Computer personnel who are experienced O/S Operators. Mid size frame running COBOL, CICS, MVS, HASP, ESZ, and TSO. Must be experienced in all phases of Operations JCL, Job setup, Procedures, etc. Shift Work.

If you can qualify, please contact:

CBN Personnel

CBN Center

Va. Beach, VA 23462

CBN is an Equal Opportunity Employer.

OPERATIONS SUPPORT

Evangelical Christian Ministry seeks qualified Computer personnel who are experienced in Operation Support. Must know O/S JCL Support, Utilities, TSO C-LISTS, Job Scheduling (automated preferred) and be able to setup accounts to procedures.

If you can qualify, please contact:

CBN Personnel

CBN Center

Va. Beach, VA 23462

CBN is an Equal Opportunity Employer.

COSMO DATA SERVICES

Nationwide

Call us for information on opportunities in all areas of the country including Sunbelt. For a confidential telephone interview call

Toll Free 800/327-7260

or in Florida call 1/305/771-9910 collect.

Cosmo Data Services

5301 N. Dixie Hwy.

Fl. Lauderdale, FL 33344

All fees paid by clients.

Tano Corp., a designer and manufacturer of automation, control and data communication systems has immediate opening for:

REAL TIME PROGRAMMERS

Major or minor in Computer Science or equivalent, and 1-3 years experience with Real Time mini-micro applications. PDP-11/RSX-11/MACRO and FORTRAN and/or M6800 Assembly Language. Contact Susan Pankowicz, Personnel Manager or send detailed resume to:

Tano Corp.

4301 Poche Court West

New Orleans, LA 70129

504/254-3500

An equal opportunity employer.

AUGUSTANA COLLEGE DIRECTOR OF COMPUTER SERVICES

Responsible for direction of a computer center which employs a staff of six and provides both academic and administrative services at a non-remunerative liberal arts college. Facilities include a PDP 11/70 time sharing system with 17 academic and 20 administrative terminals. College also maintains a computer network of several computer centers. Administrative experience in a computer center is required, preferably at a college or university. Salary competitive and commensurate with qualifications. Send resume to Glen E. Brondum, Vice President for Financial Affairs, Augustana College, Rock Island, Illinois 61201. An equal opportunity employer.

Computer firm seeks Computer Scientist. Duties include the design, development and implementation of a state-of-the-art data base management system based on a highly advanced interface model. Candidates must hold a PhD degree in Computer Science and must have research background in implementation and performance optimization of data base management systems. Salary: \$32,000 per year - 40 hours per week. Applicants send resumes to Donna Conlin, Computer Corporation of America, Dept. AC, 675 Massachusetts Ave., Cambridge, MA 02139. (617) 492-8880. equal oppy. employer, m/f.

SOFTWARE PROFESSIONALS

NCR doubles your career options in San Diego

**SYSTEMS ENGINEERING****NCR Systems Engineering/Scripps Ranch**

Advance your career by helping shape a whole new generation of interactive, transaction-oriented distributive processing systems. Our recently-created Systems Engineering Group embodies a whole new approach to software development for NCR's top-of-line mainframes. You'll work with advanced VLSI capabilities, and with mainframes that represent a quantum leap beyond any NCR has marketed before. You'll use new concepts in data communications and PASCAL-based languages. And you'll have the opportunity to make significant advances in systems architecture, performance and data base management design.

Immediate Openings for:**Senior Staff Analyst**

You will be responsible for technical guidance and leadership in the development of medium and large scale interactive software systems involving Product Management and Architectural Services. Qualifications include a BSCS or equivalent, and 6 or more years experience of systems development.

Operating Systems

Our O/S Group designs and implements advanced system software for small, medium, and large systems. Projects encompass such areas as interactive multi-programming, virtual memory and on-line transaction processing using PASCAL-based languages. You'll need a BSCS, with exposure to operating systems development, programming experience in high-level block structured languages, tools development, or data communications.

Performance Measurement

You will measure and analyze the performance of a major software system, design performance benchmarks, monitor system performance throughout development, and specify performance instrumentation. You should have a BSCS/BSEE with at least 3 years experience in performance measurement, and operating systems familiarity.

Configuration Management

You will be responsible for integration of software, firmware, and testware. Project areas include functional specification review, test bed development, and monitoring and evaluation of test results. Background should include a BSCS degree, and experience in COBOL/PASCAL and assembly language programming.

Product Evaluation

You will be responsible for product evaluation including reviews and test development. BSCS degree required with a minimum of 4 years experience in systems development or evaluation. Knowledge of COBOL, PASCAL and work on Data Base is desirable.

Firmware Systems

You will implement virtual machines on new VLSI-based systems and work in microprogramming and emulation. A BSCS/equivalent plus firmware design experience, assembly language programming, I/O or PASCAL or COBOL is required.

For prompt attention, send your resume to: Doug Sjoberg,
Personnel Resources, Systems Engineering/Scripps Ranch,
Dept. G-54, NCR Corporation, 9900 Old Grove Rd.,
San Diego, CA 92131.

COMPUTER ENGINEERING**NCR Engineering & Manufacturing/Rancho Bernardo**

If you welcome the stimulation inherent in creating a new generation of medium and large-scale mainframe systems, consider NCR. Our Engineering & Manufacturing facility in San Diego offers you a chance to help develop the most ambitious systems ever undertaken by NCR.

You'll be part of a major design operation. And will work with top professionals who are showing the way in advanced systems architecture, virtual systems capabilities, multiprocessing, data base management, firmware emulation, and advanced circuit technology. In short, you'll be shaping total systems that meet the needs of the future in one or more of the following project areas:

SOFTWARE SYSTEMS DEVELOPMENT

- Interactive Processing
- Performance Evaluation
- High-Level, Block-Structured Software
- Operating Systems
 - High Level, PASCAL-Based Language
 - Job Control Language, I/O Sub-Systems, Satellite Services File Management
 - Development of fifth generation multiprocessor large GP systems with virtual memory capability
 - Low level executive system initialization, system recovery, file management, software diagnostics/debug
- Next generation FW development
- Telecommunications Systems
- Tools Support

SOFTWARE QUALITY ASSURANCE

- Develop/Execute test for Software Evaluation
- Audit Software Development

FIRMWARE DEVELOPMENT

- Design machine emulators and virtual machine interpreters

- System design of multiprocessor distributed logic systems
- Design/Implement Distributed Processing Systems using VLSI technology
- Systems Performance Measurement

TESTWARE DEVELOPMENT

- Interface with H/W, F/W, S/W designers to diagnose system H/W failures for customer engineers
- Design diagnostic O/S utilities and test programs for VLSI technology H/W

**INTEGRATION TEST—
SOFTWARE/FIRMWARE/
TESTWARE**

- Develop and execute systems integration and test plans
- Specification review/analysis and liaison with developers
- Monitor and evaluate test results

MIS APPLICATIONS

- COBOL, On-Line Business Programming

For prompt attention, send confidential resume and salary history to: Mr. Hal Ostrander, Personnel Resources, Engineering and Manufacturing, Dept. I-54, NCR Corporation, 16550 W. Bernardo Drive, San Diego, CA 92127

San Diego Lifestyle

Sun and surf and California living at its best. Both Rancho Bernardo and Scripps Ranch are in modern specially-designed facilities located in highly attractive areas. San Diego and its surroundings offer a broad range of housing options and living environments. Our broad benefits program includes relocation assistance.

NCR

Complete Computer Systems

An Equal Opportunity Employer

position announcements position announcements position announcements position announcements position announcements

PROCESS COMPUTER SPECIALIST

Aramco needs outstanding process computer specialists on the energy frontier in Saudi Arabia. We're offering outstanding incentives to get them, including up to 40 percent pay premium.

The application of process computers to Aramco projects has accelerated the need for experienced computer system specialists in systems engineering, systems software, real-time application of programming, computer hardware, instrumentation, and NGL process engineering.

Need best people for challenging jobs

Aramco has challenging job opportunities on oil, gas and NGL control systems, offshore and onshore SCADA, metering, chromatographic systems, terminal systems, and many more.

Aramco, the principal oil company helping the Saudi Arabian government develop its energy resources, is involved in projects that are overwhelming in scope, complexity and inventiveness.

The Company is dedicated to applying process computer systems to all areas. That's why we need some very talented process computer specialists. Openings are available immediately for direct foreign assignment, temporary USA project teams, or permanent domestic assignments, depending on your particular qualifications.

Process Computer Software Engineers

We require Process Computer Software Engineers with a B.S. degree in engineering, math or computer sciences, and 3 or more years' experience in various real-time pro-

- Software Systems Engineers
- Process Computer Control Specialists
- Hardware Systems Engineers

cesses, SCADA, projects, or process systems.

Process Computer Control Specialists

We also need Process Engineers with a B.S. in chemical engineering, and 3 or more years' plant experience and process computer control application experience.

Process Computer Hardware Systems Engineers

Process Computer Hardware Systems Engineers are needed with a degree in electrical engineering, computer science or engineering, computer science or engineering technology, plus 3 or more years' experience in designing and maintaining process computer and instrumentation systems.

Unsurpassed compensation and benefits

The Aramco salary is competitive and a cost-of-living differential increases it even further. In addition, Aramco people in Saudi Arabia receive a tax-protected premium which can amount to up to 40 percent of the base salary.

Money aside, Aramco offers an outstanding combination of benefits, including 40 days' vacation every year, comfortable housing, abundant recreation, and an excellent American-style school system for the children.

Extra overseas bonus and new voluntary "bachelor" status for married men

Newly hired employees for Saudi Arabia also receive a one-time, lump-sum, fully tax-protected Overseas Employment Bonus of up to \$5,000.

And now all of the attractive compensation and benefits are available for married employees who may want to work overseas on a temporary "bachelor" status for the first year. This program includes three free repatriation trips by air during this one-year period, and the option to request family status at three conversion dates during that same year.

Interested? Call our 24-hour line any day: (713) 750-6965. If you wish, call toll-free: (800) 231-7577, ext. 6965 between 7 A.M. and 5 P.M., Monday-Friday, Central Time.

If you prefer, send your résumé in full confidence, or write for more information to: Aramco Services Company, Department CW0126-DR04A, 1100 Milam Building, Houston, Texas 77002.

CHALLENGE BY CHOICE
ARAMCO
SERVICES COMPANY

COMPUTER HARDWARE SERVICES & SALES

Join our rapidly growing computer service company. We offer unlimited opportunity to those with initiative and ability. Systec provides a full benefit package, top salaries, and participation in Systec's future.

Immediate openings for field engineers with IBM 360/370/303X plus plug compatible CPU and peripheral experience. We also need top notch DEC people now!

If you are ready for a company where your abilities and contributions will be recognized and rewarded, call today. At Systec you are not just a part of the company... YOU ARE THE COMPANY.

Phone: 800-327-2202 In Fla.: 305/323-0230



Equal Opportunity Employer m/f

2715 Navigator Ave.
P.O. Box 2015
Sanford, Florida 32771

FLORIDA! HOT FUN IN THE WINTER TIME

Do you career path in Data Processing allow you creativity, advancement potential, interesting opportunities, and state-of-the-art hardware/software? Not CALL ME! to fill in the missing link. I've got the positions if you've got the talent. Most eminent needs are listed below:

EDP AUDITORS (3)	To \$35K \$32K
SYSTEMS/PROGRAMMER-MVS INTERNALS	\$35K+
NEEDS/2 CIP/BANKING	\$30K+
DATA/COMPUTER ENGINEERING	\$28K
IDMS/COBOL/ACCTG	\$28K
BAL/CICS PROGRAMMER	\$25K
COBOL/CICS FIN/MANU	\$25K
RPG II-SSP/C/CPP	\$25K

MANAGERS OTHERS NOT LISTED!

All responses held strictly confidential. Serious inquiries only. For immediate attention and results, contact:

GEORGE ANDREWS

MARC TODD CONSULTANT
1150 N. FEDERAL HIGHWAY
FT. LAUDERDALE, FL 33394
305/482-8863

SERVICE CHARGE AND RELOCATION ASSUMED BY CLIENT COMPANY.

EDP Pro

We are a prestige publisher in midtown NYC who is seeking a proven EDP professional to direct our Department. We are a PDP 11/70 RSTS shop with sophisticated on-line applications. Additional systems developments are underway.

Candidates require hands-on experience with RSTS, FORTRAN and BASIC + 2. In addition, experience with accounting/financial systems is a strong plus.

The ideal candidate will be in a position to develop the department and will have high visibility to top management.

We offer full company paid benefits, including dental. Submit resume, including detailed salary history and requirements in complete confidence to:

CW Box 2488
375 Cochituate Rd., Rte. 30, Framingham, MA 01710
An Equal Opportunity Employer

ANALYSTS PROGRAMMERS

Would you enjoy supportive management, challenging assignments, reward based on performance not politics, pay for all hours worked, bonus opportunities & more?

We need dedicated professionals with at least 3 years DP experience with IMS, CICS, PL/I, TSO, OS/COBOL, BAL. Age no consideration, willingness to travel a plus. Immediate openings in the:

SOUTHEAST SOUTHWEST

and

ATLANTIC COAST

Call collect: Mike Harris or William Carter (404) 633-9387 or send resume to:

DATA RESOURCE CORP.

1649 Tullie Circle N.E.
Suite 110
Atlanta, Ga. 30329
Equal Opportunity Employer

RPG II Programmer

Live & Work in Beautiful Oregon

Expanding State-wide Savings & Loan converting from IBM System 3- Model 15D to System 38 needs 2 yr. experienced RPGII programmer. Financial exp. desired. Send resume, including salary history, to Ketti Jackson.

AMERICAN FEDERAL SAVINGS & LOAN

P.O. Box 430
Salem, OR 97308
(503) 399-5542
Individuals only apply.
Equal opportunity employer M/F

OREGON WASHINGTON

Capacity Planning Specialist

Seattle area blue chip company requires a capacity planning/performance measurement professional. Individual will be responsible for tracking resources, implementing needed changes (hardware/software), and fine tuning system. Requires large IBM OS/MVS experience, ability to plan and evaluate. Previous security/disease-free experience a definite plus. \$33-37K

Systems Support DOS/VSE

NW manufacturer has new opening for Systems Programmer with 3-5 years DOS/VSE/SAMM internal experience. Exposure to CICS/DL-1 a plus. Will be involved at several sites installing IBM 4331s. No overnight travel. To \$30K

Many technical, systems and programming opportunities available throughout the west. Call collect or send resume to:

(208) 455-8300

Al Friedman Judy Heydrick

Foote-Waldron

310-106 Avenue, N.E., Bellevue, WA 98004

position announcements

position announcements

position announcements

position announcements

position announcements

Unique Nationwide Opportunities for Computer Systems, Sales, Consulting and Management People!

If You Pass This Test, You Could Be Worth **\$50-\$100,000+ Per Year.**

1. I have 3-10 years of direct data processing experience.
2. I will earn between \$20-\$40,000 this year and want to earn more.
3. I am money motivated and strongly desire a job in data processing that will reward me directly for my efforts.
4. My appearance and articulation are above average.
5. Most of my friends and relatives consider me a competitive person.
6. I would like to own part of my company without a direct investment.
7. Recognition for outstanding performance is important to me.
8. I am competent when working independently without supervision.
9. I find it confining to work in a large structured corporate environment.
10. I enjoy working on a variety of projects simultaneously.
11. I have a college degree.

YES NO

If you answered "Yes" to at least ten of these questions, you match the success profile of people in our organization who earned from \$50,000 to over \$100,000 in 1980. You can earn this much money, too.

We're committed to growth.

We are a highly dynamic growth organization providing a unique professional service to all segments of the computer field. Over the past five years, we have achieved a compound growth rate in sales and profits in excess of 50% per year—and we intend to maintain this growth throughout the 80's. Our research indicates that we have barely scratched the surface of our total market potential with a current penetration of only 2%.

Our growth depends on people like you.

We believe that people are not only our most important

asset—they are really our only asset. As a result, we provide an environment where you can grow while helping us grow. All the executives of our organization are computer people who are highly receptive to change. Although well-established, we're still small enough that your creative thinking can have a direct impact on company policy and direction. New ideas and approaches are the very lifeblood of our existence.

We'll stretch your capabilities.

If you're like others in our organization, you'll be delighted at the rate of your personal and professional development. This is partly due to the nature of the job itself. It's also a function of our elaborate ongoing training programs where we'll sharpen your oral, written, marketing and overall business skills. These advanced programs combine video and audio tapes, extensive formal classroom study and on-the-job training.

You'll get a "piece of the action."

Our compensation program is geared to people who want their earnings dependent primarily upon their own individual ability and effort. In a very real sense, we offer you the opportunity to run your own business without any financial investment on your part. Our compensation package is open-ended and includes a high base salary and a combination of individual and group profit incentives. In addition, our company-paid profit sharing plan will allow you to earn stock in the organization based on your personal achievements. (The value of our stock has increased over 1500% since 1974.)

Openings nationwide.

During 1981, each of our existing facilities will be expanded and we also plan to open a number of new branch offices. As a result, if you live in or near one of the country's top 50 metropolitan areas, you won't have to relocate to join us.

Write to our President.

If you want to know more about how you could fit in our growth plans, just write to our President in care of the special Computerworld box number given below. Your response will be held in strict confidence. (All of our existing employees know of this ad.) We realize that the type of successful person we seek may not be actively pursuing a position at this time. For this reason, a detailed experience résumé is not required. We are an equal opportunity employer. Write today—it may be your chance of a lifetime.

**CW Box 2471
375 Cochituate Road,
Route 30
Framingham, MA 01701**

position announcements

position announcements

position announcements

position announcements

position announcements

MARKETING OPPORTUNITIES

MDSI, a leader in computer aided manufacturing products and services, has several growth opportunities available for experienced marketing professionals in the areas of:

- Computer graphics
- Computer aided engineering
- Hardware/software systems
- Numerical control systems
- Strategic business planning
- New venture analysis

These management level positions are high visibility opportunities for individuals experienced in computer-oriented industrial and manufacturing marketing and product opportunity analysis, business planning, market development, sales tool development, and new product introduction. Join a winner!

**Call George Peterman at (313) 995-7374
Monday through Wednesday, or send resume to:**

Manufacturing Data Systems Incorporated

4251 Plymouth Rd.
P.O. Box 986
Ann Arbor, MI 48106



We Are An Equal Opportunity Employer M/F/V/H

SAN FRANCISCO

Are you a professional? Then use a professional in your search...it works!

- Systems Programmers
- EDP Auditors
- Data Base Administrators
- Systems Analysts
- Programmers—COBOL, PL/I, RPG II, FORTRAN, ASSEMBLER
- Project Leaders—Banking, Manufacturing, Retail
- Marketing Support Programmer/Analysts
- Technical Writers
- Mini's—Programmers, Analysts, User Liaison

All fees assumed by clients. We have over 1,000 positions in the Bay Area...Call Collect.

ROBERT HALF
OF NORTHERN CALIFORNIA, INC.

Jerry Anderson • Bob Couch • Linda Strickland
111 Pine Street, 15th Floor
San Francisco, Ca. 94111
(415) 434-1900

Jim Dupre
2 Palo Alto Sq., Ste. 212
Palo Alto, Ca. 94304
(415) 493-8700

675 N. 1st St., #609
San Jose, Ca. 95112
(408) 293-9040

DATA PROCESSING

FREE EDP POSITION DIGEST

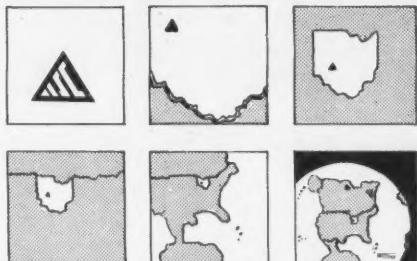
Our Winter Edition representing hundreds of positions locally and thousands nationwide is now available to you. The Data Processing Professional Positions include PROGRAMMERS, ANALYSTS, SYSTEMS SOFTWARE COMMUNICATIONS, MANAGEMENT, and MARKETING. For your free copy, call or write with NO obligation:

BAI LIMITED
229 Peachtree St., N.E.
Suite 1601 Cain Tower
Atlanta, Georgia, 30303
(404) 581-0040

SYSTEMS PROGRAMMER

Growing DP team in sunny south seeks Systems Programmer with minimum two years experience with IBM 370/138. Language COBOL under DOS/VIS. Additional desirable experience includes CICS, DL/I, SPMOL and POWER. Salary commensurate with experience and ability. Superior fully paid benefits package. Send full resume including salary history and requirements to Personnel Manager "A", P.O. Box 1502, Savannah, Georgia 31402.

Equal Employment Opportunity (M/F) Employer.



**Allen Services Corporation,
we can place you
almost anywhere.**

Bring your technical experience to Allen Services Corporation and let us find a specific challenge tailored to your interests and expertise.

ASC is leading the world in Data Processing and software service. We are growing at an exceptional rate and have outstanding opportunities currently available for talented professionals. With our Fortune 500 you can work in many diverse environments which will allow you to use your skills to the fullest, and learn new techniques on up-to-date hardware and software systems.

We offer Time and 1/4 OT Pay — Paid Vacations and Holidays — Company Paid Health, Life, and Dental — Per Diem — Prescription Drug Plan — Profit Sharing/Retirement Program. With ASC, your professional career can be satisfying and exciting. Why not let yourself grow with a leader? Call us toll-free at the number listed below.

**ALLEN SERVICES
CORPORATION**

ALLEN SERVICES CORPORATION
212 W. National Rd., Vandalia, OH 45377 (in OH: 513-890-1200)
Equal Opportunity Employer/M-F

800-543-7583

position announcements

position announcements

position announcements

position announcements

position announcements

Seeking Senior Programmer to do detail design and development of a portion of a Honeywell Software Product, the Network File Transfer, under guidance of a Senior Software Developer. Must develop detailed software flow charts and translate them into Level 6 assembly language. Will use Session Control of Networking Software to transfer the Control of Networking Software to transfer the data block. Will utilize the Honeywell DSA Network involving use of Multics and Level 6 hardware and software. Requirements include a B.S. in Math and an M.S. in Computer Science or Engineering. Also required are knowledge of Multics, software factory on Multics, assembly languages and networking applications. Strong background in computer hardware is required as well as familiarity with Networking architecture, including the software interface to the networking layers such as session and presentation control, and strong training in theoretical analysis in software. Salary \$21,500/year. 40 hour week. Send resume and cover letter to G. Dumas, Honeywell Information Systems, Inc., 300 Concord Road, Billerica, MA 01821. An equal opportunity employer m/f.

CONSIDER A CAREER CHANGE

If you have significant experience in software development why not teach? St. Mary's College has a growing Applied Computer Science program and needs you. Requirements are a master's degree, a practical knowledge of the computer field, a liking for young people, and a desire to see them receive the best possible education. You can enjoy great freedom building new state-of-the-art courses. You can direct your energy toward projects of your own choosing. This position begins in the fall of 1981. We are absolutely an affirmative action and equal opportunity employer. We want the best for our students. If this is the opportunity you've been seeking send a letter and brief resume to:

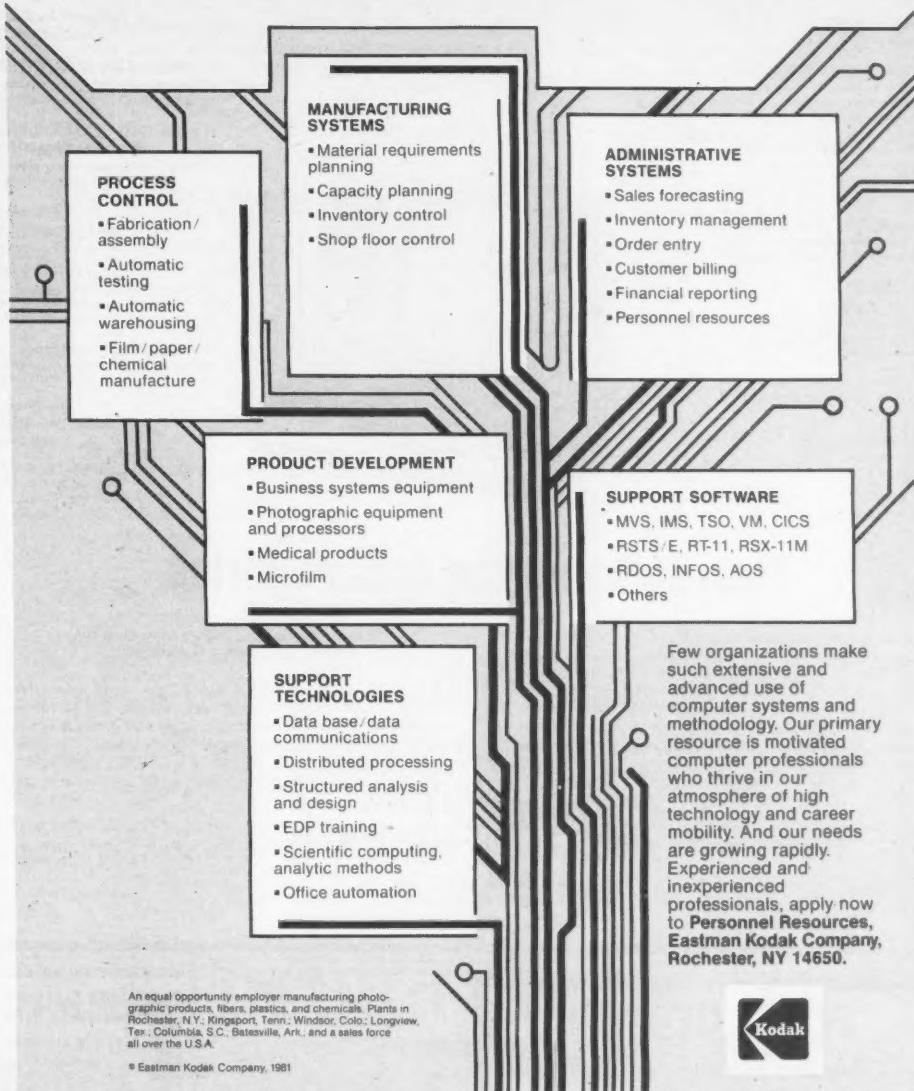
Brother James Farrell
Box 58
St. Mary's College
Winona, MN 55987

PROGRAMMER ANALYST - APPLICATION SR. SYSTEMS PROGRAMMER

University of Louisville has the following positions available immediately for experienced Data Processing Professionals. 37 1/2 hour workweek with excellent benefits including paid sick leave, insurance, liberal vacation, excellent retirement plan and 6 free credit hours per semester at the University. IBM OS/VS and/or CICS/VS up to \$24,000 based on education and experience. Forward resume to: University of Louisville, Personnel Services, 2323 S. Brook Street, Louisville, KY 40292.

An Affirmative Action/
Equal Opportunity Employer

KODAK'S NEED FOR COMPUTER PROFESSIONALS IS GROWING.



PSL

REAL-TIME PROGRAMMER I, II, or III (two positions): Bachelor's in computer science, engineering or math with computer courses plus three years of experience in programming mini or medium computers for real time applications; or any equivalent education, experience providing knowledge of TRIM III, FORTRAN; assembler programming; real-time operating systems; able to supervise; able to generate program code in several languages. Refer to 191. Salary is \$14,500-\$21,000 DOE. Deadline is Feb. 16.

Personnel Department (191-29)
Physical Science Laboratory/NMSU
Box 3-PSL
Las Cruces, New Mexico 88003

An Affirmative Action/Equal Opportunity Employer

Physical Science Laboratory

hiram college

HIRAM, OHIO 44234

(216) 569-3211

DIRECTOR OF COMPUTER SERVICES HIRAM COLLEGE

The Director is responsible for both administrative and academic computer services. Hiram, a small liberal arts college in northeastern Ohio, offers a strong program in Computer Science. Minimum qualifications include a Bachelor's Degree with experience in managing and operating a data processing center. Experience with a D.E.C. time-sharing system is preferred. Salary dependent on training and experience. Send letter of application, resume, salary history, and names of three references by February 28, 1981 to:

Robert S. Dingham
Vice President for Business Affairs
Hiram College
Hiram, Ohio 44234

Hiram College supports equal opportunity in education and employment.

Data Processing

SYSTEMS ANALYST

Bell & Howell is looking for a Systems Analyst to function in a marketing support role for our new computer related products in the following areas: New York, Chicago, Detroit, Los Angeles, Houston and Washington D.C.

If you are currently employed as a Programmer/Analyst or Systems Analyst and feel you could make a contribution as a team member involved in customer support of an exciting product line, investigate this unique opportunity.

Bell & Howell offers outstanding benefits, attractive salary, and an opportunity to move ahead with a progressive and professional organization. If interested, please submit your resume in complete confidence to:

BELL & HOWELL
COM PRODUCTS DIVISION
1451 Quail Street
Newport Beach, CA 92660

BELL & HOWELL

Equal Opportunity Employer M/F/H

| position announcements |
------------------------	------------------------	------------------------	------------------------	------------------------

The Zenith Microcomputer.

Compare the positions.

Positions Available
in St. Joseph, MI

HARDWARE ENGINEERS

For the development of memory products, displays, IO devices, disk products and analog power systems.

FIRMWARE ENGINEERS

Development of real time code for a wide variety of microprocessor based products.

MECHANICAL ENGINEERS

Design of large volume mechanical systems using high technology materials.

SOFTWARE CONSULTANTS

Supervisory and consulting positions responsible for technical software support of customers.

Those interested in our St. Joseph, MI opportunities should call collect or send resume to:

Mike Wakefield
616/982-3673
Dept. CW98

Hilltop Road
St. Joseph, MI 49055



Then compare the opportunities.

In terms of project challenge, state-of-the-art technology and ground floor potential, you'll find the opportunities at Zenith Data Systems incomparable. For example, take the Zenith Data Systems Z89 microcomputer...with dual Z80 microprocessor control, 64K of user RAM, 100K storage, built-in 12" diagonal CRT...only one of the new microcomputer, peripheral and software products we've developed.

ZENITH
data
systems

A Wholly Owned Subsidiary of
Zenith Radio Corporation

An Equal Opportunity Employer m/f/h

Pure Innovation...Solid Zenith Quality AND JUST THE BEGINNING!

Join us in the forefront of one of our most innovative phases. You'll find corporate wide impact and mobility, and an exceptionally stimulating project oriented environment. Compare it all...then call.

EDP AUDITOR

An excellent opportunity with high visibility is offered by a dynamic subsidiary of Tiger International, a diversified NYSE-listed transportation company.

As part of our team in Chicago, selected candidate will be responsible for the performance of data center operational audits and computer applications audits, supervising and training EDP audit staff, coordinating EDP audit activities with outside auditors, and instructing internal auditors as required. Individual will also develop computer programs and computer audit techniques to ensure control reliability, and participate in the implementation of applications.

Degree in business administration or accounting, two years each EDP auditing and data processing or audit experience required, coupled with an exposure to data base inquiry language and solid communications skills. Familiarity with IBM 360 or 370 large-scale computers and large communications network experience would be assets. Travel involved (10 - 20%).

Attractive compensation and outstanding benefits accompany this position, plus advancement opportunities. For consideration please send resume and salary history in confidence to:

TIGER

Jerry Morgan
North American Car
Internal Audit
222 S. Riverside Plaza
Chicago, IL 60606
(312) 648-4087

Equal Opportunity Employer

PROGRAMMERS

Decision to expand and upgrade current D.P. dept and equipment has created opportunities for programmers with 3+ years S/34 experience.

This dynamic mfg co offers convenient midtown location and attractive benefits. Salary commensurate with experience and qualifications.

For confidential interview send resume including salary history and requirements to Dept. P, P.O. Box 1788, Grand Central Station, NY, NY 10017.

COMPUTER OPERATIONS MANAGER BANKING

The position requires an innovative professional to manage the computer operations section of a \$11M savings bank. The hardware consists of an NCR V8575 operating on a 3-shift basis.

This is a unique opportunity for an individual seeking advancement in the exciting, evolving bank data processing field and offering an excellent opportunity for an interested individual to extend his/her skills and to work in a team environment.

Applicants must have a minimum of 3 years experience in computer operations management. The salary will be commensurate with experience. The bank's total benefit package is outstanding.

Please phone Albany Savings Bank, Albany, N.Y., 518/445-2043, for an appointment.

MIS DIRECTOR

We are a rapidly growing real estate development, management, and construction firm located in downtown Boston seeking a data processing professional to direct our new MIS department. Reporting to the Chief Executive Officer, the MIS Director will be responsible for the hiring and supervision of DP support personnel, for information planning and systems design, and for the evaluation, selection, and implementation of new hardware and software packages. The Director will be expected to lead the company in articulating information needs and will work closely with line management in the design of systems to meet those needs.

The successful candidate will have the following qualifications:

- Five to ten years of data processing experience, including experience in data base design and on-line systems;
- Three to five years management experience with a record of delivering systems on schedule and within budget;
- Experience with project control and financial reporting systems;
- Proven supervisory, administrative, and interpersonal skills;
- Undergraduate degree required, advanced degree desirable.

We offer a competitive salary and fringe benefit package. Forward resume and salary history in strict confidence to:

Carol Judson
Director of Administration
The Beacon Companies
One Center Plaza, Boston, MA 02108
an equal opportunity employer



OS COBOL

A definite career enhancement with this top-of-the-line firm with + year experience in the COBOL LINE and TELEPROCESSING experience. Responsibilities are all developmental in dual 370/158 and 3033 environment. Prestigious, progressive and well managed.

\$33,000

DEC COBOL INTERACTIVE

Exciting challenge where capability outranks seniority. 2+ years interactive COBOL programming experience. Aid in development of interactive systems on DEC 20. Very well organized. Benefits include 30 days vacation.

\$36,000

ANALYST OS SYSTEMS

Excellent upper level position for analytical idea person. 4+ years systems analysis with OS COBOL in batch and real-time. Responsibilities include supervision of 3 programmers working on A/R project. Converting to 4341 in March. No programming.

\$31,000

ALL FEES PAID

Call: MARTY AMATO

ROBERT HALF OF NEW YORK, INC.
322 Fifth Avenue
New York, N.Y. 10036
212-221-8500 (agency)

EMPLOYMENT OPPORTUNITY IN THE SAN FRANCISCO BAY AREA.

DATA SYSTEMS MANAGER - REDWOOD CITY, CA (\$2150-\$2860) Considerable experience in data processing systems design, administration, and implementation including supervisory experience and graduation from an accredited college with a degree in Business or Public Admin., Computer Science, or related field. Apply Personnel Dept., 1038 Middlefield Rd., Redwood City, CA 94083 EEO/MF

Computer Science faculty position. Teach undergraduate and graduate courses in expanding program with business, scientific, and system options. Rank: Assistant/Associate. Salary: \$20,000-\$27,000 for 9 months based on experience and qualifications. Ph.D. preferred. Excellent research and consulting opportunities available. Excellent living conditions. Send resume and three references to:

Dr. Jack Thompson, Head
Computer Science Department
School of Engineering
University of Tennessee at Chattanooga
Chattanooga, TN 37402

UTC is an equal opportunity, affirmative action employer.

position announcements

position announcements

position announcements

position announcements

position announcements

Programmer/ Analyst

Immediate opening for the candidate with a minimum of 2 years RPG II and a minimum of 1 year System/34 or System 3 CCP interactive on-line programming.

We offer superior working conditions and majority of work will be on new applications. Call or send resume to Ralph Doak, Data Processing Manager.



P.O. Drawer J
Walnut Creek, CA 94596
(415) 938-7070
Equal opportunity employer

Technical Staff Member

Alphatech, Inc. seeks a technical staff member(s) to perform research in large scale control systems that include human operator interaction elements in the decision-making paths. The research requires the development of analytical models of dynamic human decision-making in man-machine and computer systems, and the design of man-machine interfaces. Minimum requirement is a Ph.D. in Man-machine Systems/Modern Control Theory is required, with a knowledge of decision and control theory applied to modeling of human performance processes and decision-making, and with proficiency in FORTRAN programming. Salary is \$31,000 per year. Forward resume to: Alphatech, Inc., New England Executive Park, Burlington, MA 01803.

An Equal Opportunity, M/F employer.

PROGRAMMER COBOL

IBM/DICS	To 40K
+IBM 370/OS	
HP3000 PROG ANAL	
+BASIC/COBOL Sr., MRP	To 35K
RPSI PROG. ANAL	
+Sys3/150, CCP + 34	To 30K
SYSTEMS PROGR.	
IBM 303X + 8100 + CICS	To 40K
"MULTI-OPENING"	
So. Bay, Penin., E. Bay & S.F.	
Call Rich Abram	
"D.P. - It's Our Business"	
(408) 377-1774	
1000 N. 1st Street, Suite 1004	
Campbell, CA 95008	
deVencenzi Assoc.	
Personnel Service/Never a fee	

An Equal Opportunity, M/F employer.

California State University Los Angeles

Full time tenure track positions available at assistant or associate professor level. Doctorate or masters plus outstanding achievement in programming, systems analysis, data base design, distributed systems, or computer modeling preferred. Applications must begin Feb. 1, 1981 and will continue until the positions are filled. Write or call:

Dr. John Glassford
Business Information Systems Dept.
CSU-LA
Los Angeles, CA 90032.
213/224-2054

CALL F-O-R-T-U-N-E FIRST
A now job should always
be an upgrade!

DATA PROCESSING MGR..... To \$35K
Banking, S/L, IBM equipment.
SYSTEMS ANALYST..... To \$30K
Business Applications. Degree. 3+ yrs. exp.
PROJECT TEAM LEADER..... To \$28K
MS degree/process control/MRP are pluses.
SYSTEMS PROGRAMMER..... To \$27K
Technical exp. can substitute for degree.
SYSTEMS PROGRAMMER..... To \$26K
Mfg., IBM 370, CICS, MRP +.
PROGRAMMING MANAGER.... To \$25K
Fincl. application, IBM, banking exp. preferred.
Please contact the F-O-R-T-U-N-E offices
nearest you:

CHARLOTTE(704) 527-5810
1 Woodlawn Green, Suite 136, Charlotte, N.C. 28210
FT. LAUDERDALE(305) 764-6022
1150 N. Federal Highway, Ft. Lauderdale, Fla. 33304
FT. WASHINGTON(212) 542-9800
455 Pennsylvania Ave., Ft. Washington, Pa. 19034

F-O-R-T-U-N-E

\$2,000 REWARD for EDP PROFESSIONALS

InterNorth is committed to the discovery and utilization of our vast natural resources. We are a 3 billion dollar corporation with highly diversified activities. From Alaska, the Gulf of Mexico, Canada and the continental U.S., we are increasing the country's energy options...in natural gas, LNG, propane, coal and petrochemicals.

If you have high professional goals and share in our commitment, consider a partnership with InterNorth. We'll back YOUR commitment with a \$2,000 employment bonus if you are qualified and hired for one of the following positions.

SYSTEMS SUPPORT SPECIALISTS

We have several challenging positions for innovative technical specialists in support of state-of-the-art large scale multiprocessing systems and a distributed processing communications network. We are seeking degreed individuals with knowledge/experience in the following disciplines:

DATA BASE/TRANSACTION PROCESSING

To provide data base administration and support for on-line transaction processing applications. Desirable knowledge/experience:

Burroughs large scale systems, DMS-II, DM-INQUIRY, GEMCOS, REPORTER

—or—

IBM 4300/370 systems, DL/1, IMS, RAMIS-II, CICS

DATA COMMUNICATIONS/NETWORKING

To provide data communications/network planning and support for distributed processing environment. Desirable knowledge/experience:

Burroughs large scale systems, DCP, DCALGOL, NDL, MCS (CANDE, RJE, etc.)

Synchronous, asynchronous protocols

—or—

IBM 4300/370 systems, 370X, SNA, VTAM, ACF, NCP, MSNF, SDLC, bisynchronous protocols

We are implementing a distributed processing network consisting of IBM 4300 systems linked to a Burroughs B7800, and you'll play a major role in performing some of the critical activities involved in this effort. If you have a degree and feel you can contribute to this effort by drawing upon related technical experience, creative problem solving capabilities and the ability to work effectively with other EDP Professionals. Users and Management, we can offer you challenge, responsibility and rewards based on performance.

Advanced and progressive management and personnel policies are a hallmark of InterNorth. Salaries are competitive and benefits are excellent including a fitness center complete with a swimming pool, gym, running track, and racquetball courts, plus a company matching savings plan and full tuition refund.

If you feel up to the challenge and meet the qualifications, forward your resume and complete salary history in confidence to: Gene Grimm, InterNorth, 2223 Dodge Street, Omaha, Nebraska 68102.

An Equal Opportunity Employer M/F/H
Agency Referred Applicants Will Not Be Eligible For This Bonus.

INTERNORTH

PROGRAMMER/ANALYST

We have an opening for a bright, energetic, self-starter experienced in FORTRAN, BASIC and microcomputers to work in Downstate's Scientific Computing Center. 4 weeks vacation and excellent benefits. Salary \$20,000. Send resume to:

Mr. Joel B. Ellenschein
Employment Manager
SUNY Downstate Medical Center
Box 1184-A, 450 Clarkson Avenue
Brooklyn, NY 11230

Equal Opply/Affirmative Action Employer

HOUSTON

MANAGER-APL SERVICES

To \$40K
A large oil company bringing APL in-house is searching for a manager to take responsibility for staffing and organization. Experience in timesharing industry, familiarity with APL, and the support necessary to furnish this service is required. Ideal candidate will be degreed (MBA a +) and possess excellent communication skills for frequent end-user interface.

DATA BASE ANALYST

To \$34K
Join this elite group in a major life insurance firm. Two or more years of data base design (IMS DB/DC) and experience with MFS and the UCC-10 data dictionary qualifies (ADP is a plus). This group's expertise provides quality assurance through design review, consultation, and optimization. Relocation benefits are excellent and include low interest mortgage money.

PROGRAMMER/ANALYST (MBA)

To \$31K
This is a small organization implementing the MSA financial packages. The payroll segment is in; the benefits/personnel and accounting system remain to be implemented. If you have MSA experience, a knowledge of OS/JCL, and good COBOL skills, join a growing company with state-of-the-art systems and excellent benefits. CICS exposure a definite plus.

**the
jarvis walker
group**

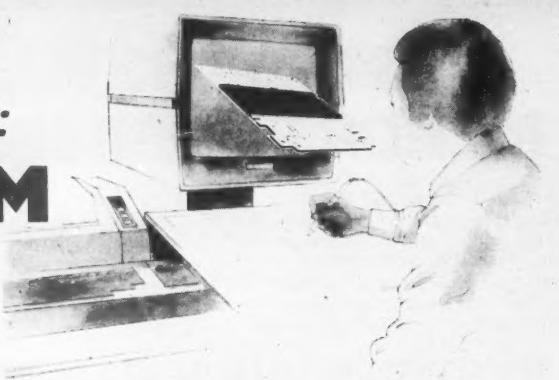
3050 S. Post Oak Road
Houston, Texas 77056
(713) 961-3600

| position announcements |
------------------------	------------------------	------------------------	------------------------	------------------------

Software You Can See:

CAD/CAM

It's just one of the special attractions you'll find at Computervision. As the #1 company in Computer-Aided Design/Computer-Aided Manufacturing, we've installed more CAD/CAM systems than anyone else, and developed the technology for more applications of CAD/CAM than anyone else—from microelectronics to the newest generation of jet airliners.



Through the application of the most advanced computer technology to interactive graphics, CAD/CAM offers software professionals the unique opportunity to literally see their work materialize. It's unparalleled satisfaction. And Computervision offers the most challenging, exciting opportunities in CAD/CAM: the most advanced technology, the widest range of applications, the highest level of vertical integration, and leadership in a field that is growing 50% annually.

Change your imagination into reality, actually see it happen. At Computervision.

Systems Software

Our Systems Software Group is involved with the development of our next generation product lines as well as the redevelopment and enhancement of our existing interactive graphics systems. Our needs are varied, but most important for individuals experienced in the following areas:

- Operating Systems
- Communications & Networking
- Language & Development Tools
- Data Base Management
- Graphics Information Systems
- Systems Integration

We offer an excellent compensation and company-paid benefits program, including medical, dental, disability and life insurance, educational reimbursement, and retirement, stock purchase and bonus incentive plans.

Applications Software Development

Computervision's graphics-oriented automation systems possess the comprehensiveness and technically advanced capabilities to do more jobs in more applications than any other systems. Opportunities exist for individuals experienced in the following applications:

- Mechanical Design
- Mechanical Drafting
- Electrical
- Civil
- Routing Systems
- Integrated Circuits
- Numerical Control
- N/C Post-Processors
- User Interface

Changing
Imagination
Into Reality.

Please forward resume and salary information, in confidence, to Norman Swanson, Dept. C-2, Computervision Corporation, 201 Burlington Road, Bedford, MA 01730. An Equal Opportunity Employer.

Systems Integration & Test

Systems Integration & Test develops formal integration plans for each software product, involvements include automation of integration, test and customer release operations. Our immediate requirements are in the following areas:

- Tools & Procedures
- Software Error Correction
- Test Engineering
- Technical Writing



What Can One Coupon Get For You? A Free Resume Kit...

An invaluable aid in your first step in your job changing process.

Scientific Placement, Inc., has put together its FREE RESUME KIT to assist computer professionals in presenting themselves to their best advantage to prospective employees. The kit presents in an uncomplicated format what years of experience in the employment service to the computer industries have taught us.

To benefit from our expertise, complete the information below and return it to us. We'll send you our kit, no strings attached. (For Computer Professionals only.)

Name	Degree	Yr. Grad.
Address	Current Employer	
City	State	Job Title
Zip	Phone	
Hobbies	Languages	
Applications	No Yrs. Experience	

We have many exclusive Data Processing positions available — locally and nationwide.



Scientific Placement, Inc. Employment Service
P.O. Box 19949 Houston, Texas 77024 (713) 496-6100

CPWEE/2881

THIS SPACE FOR HIRE.

[Inquire at Classified Advertising Dept.]

N.Y. City - CONTRACTS To

\$200/DAY
- FULL TIME, To
\$35,000

- MINI ASSEMBLER/BASIC
- IBM COBOL, DBAL or PL-I
- CICS or IMS or MARK IV
- DATAPORT

Call or forward resume to:
PARAMOUNT CONSULTANTS
 275 Madison Avenue
 New York, New York 10016
(212) 684-8606

SYSTEMS/SERVICE PROFESSIONALS

We are seeking seasoned System Support Representatives in Dallas, San Francisco, Minneapolis, and Philadelphia to maintain (software/hardware) our advanced distributed data processing system. The successful candidate must have systems expertise with a sound hardware background. If you are seeking a challenging opportunity in a dynamic environment, send your resume to:

Apollo Computer, Inc.
5 Executive Park Drive
North Billerica, MA 01862
Attn: Larry Elias
Director — Customer Services

apollo computer

An Equal Opportunity Employer

DATA PROCESSING MANAGER COMPUTER PROGRAMMERS SYSTEMS ANALYST

HAMAD GENERAL HOSPITAL
DOHA, QATAR
ARABIAN GULF

DATA PROCESSING MANAGER, 2 COMPUTER PROGRAMMERS and SYSTEMS ANALYST sought to initiate computer system for the new 680-bed Hamad General Hospital in DOHA, QATAR on the ARABIAN GULF.

SALARIES are attractive and BENEFITS excellent, including free furnished housing, air tickets to and from Doha for a family of five, 45-60 day paid vacation at the end of each education.

Interviews to be held in the U.S. in late March 1981.

Candidates are invited to send their complete resume with telephone numbers to: Dr. G. Gilbert Taliou, Director of Personnel Affairs, Hamad General Hospital, c/o University Associates, 398A Brookline Avenue, Boston, Massachusetts 02215.

BIRMINGHAM, ALABAMA SYSTEMS PROGRAMMER

We're looking for a DOS/VSE (E) Systems Programmer to work in our technical support group. Candidates should have a minimum of 1 year experience as a Systems Programmer in a DOS shop that includes a teleprocessing/data base environment.

We are currently using DOS/VSE, DL/1, CICS, VM/370, VTAM, and NCP on our 370/158.

We offer a sound income plus company benefits program including medical, life and dental insurance. For more information send your resume in confidence or call:

Ted Trimble
1-800-633-8868
**SAUNDERS LEASING
SYSTEM, INC.**

201 Office Park Drive
Birmingham, Ala. 35223
An Equal Opportunity Employer M/F

OS SYSTEMS PROG.

Corp. hqtrs. of Fortune 100 mfr. has challenging opening for detail-oriented, pragmatic, internats person. Min. 3 yrs. OS/VS exp. prior to support CICS & will eventually assist in MVS conversion. Salary \$32,000 + incentive bonus (fee paid). Contact Gerry Battista.

Robert Half of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200
Personnel Consultants

Systems Programmer

Norge, manufacturer of laundry appliances, has an immediate opening for an experienced, self-motivated individual with experience in VM/370, OS/VS1, Assembler, SYSRSTS and COBOL. VM/CMS and CICS are desirable. We offer a competitive salary, benefits package, and relocation assistance. If you qualify for this opportunity, send resume with salary history to:

Frank Scobby, Manager MIS
Norge
Division of Magic Chef, Inc.
Lydia Drive
Herrin, Ill. 62948
Equal Opportunity Employer M/F/V/H

position announcements

position announcements

position announcements

position announcements

position announcements

KANSAS CITY

Software Programmers
E&I - 35K
 MVS
 JES 2 or 3
 TSO
 IMS
 CICS

6405 Metcalf, Shawnee Mission,
 Kansas 66202, (913) 236-8288

DATA PROCESSING CAREERS INC.

TULSA

Excellent Tulsa companies are providing superior opportunities in energy and manufacturing. All with excellent benefits and competitive starting salaries:

OS/MVS Internals \$35K
 P/A - COBOL, CICS \$28K
 Oil & Gas, IMS \$33K

2624 E. 21st St., Tulsa, OK 74114
 (918) 747-3621

DATA PROCESSING CAREERS INC.

DALLAS

Software Development Managers

For Dallas developer of high technology electronic systems. Degreed, technically competent in mini-computer design, involved in planning & budget cost control. Full relo. To upper \$30's.

Suite 1109, Stemmons Tower W,
 Dallas, TX 75207, (214) 637-6360

DATA PROCESSING CAREERS INC.

FT. WORTH

Energy Company
IMS Database Analyst

Expanding development effort of
 IMS DBMS. Excellent long-term
 potential. Full relo & interview. Sal-
 ary to low \$30's.

Suite 911, One Summit Ave
 Ft Worth, TX 76102 (817) 336-4565

DATA PROCESSING CAREERS INC.

PROGRAMMER

Well established firm in Stockton has im-
 mediate need of a well qualified program-
 mer. We have a disk tape environment in a
 medium size shop.

The successful applicant will have a good
 working knowledge of COBOL and Honey-
 well experience preferred.

Area offers great recreational facilities;
 good schools and a good university. Family
 type community.

Company offers excellent fringe benefit
 package. Salary commensurate with exper-
 ience and ability. Submit detailed resume
 to: Virginia Vennes, Personnel Manager,
 Tillie Lewis Foods, P.O. Drawer J, Stock-
 ton, CA 95291.

An Equal Opportunity Employer

**Arizona/California/Texas/Colorado/Florida
 SCIENTIFIC OR BUSINESS PROGRAMMERS**

\$18-35,000.

All fees and relocation paid.
 If you have a BSEE, BSCS, BS in Mathematics or Physics or equivalent,
 we need you right now.

For Business: OS/DOS/IMS/CICS/MVS/JES Prog/Anal/Systems/
 Data Base. All large scale installations.

For Scientific: experience in the computer, communications, semi-
 conductor, or aerospace/defense industries.

Your name, resume, and present employer will not be given out without
 your permission.

For sincere personal service, please send a confidential resume to:

Dan Pullman (602) 274-5680

PULLMAN PERSONNEL

3003 North Central Ave. Suite 1706, Phoenix, Arizona 85012

APL-COBOL-PL/1

Urgent need for Programmers, Analysts, Systems
 Programmers, Hardware/Software (Microprocessor)

Work location: Rochester, N.Y.

Salaries: \$20-75,000

- Fortune 500 Companies
- Direct Hire Option

• Canadian Inquiries Welcome

Butler Service Group, Inc.

a Butler International Company (NYSE)

28 Willow Pond Way, Ste. 8

Penfield, N.Y. 14526

718/377-7520

**EDP SYSTEMS ANALYSTS,
 PROGRAMMERS**

**Earn up to 40 percent more, save more,
 vacation more as you take on new job challenges
 with Aramco in Saudi Arabia**

Aramco needs outstanding people on the energy frontier in Saudi Arabia. We're offering outstanding incentives to get them. Up to 40 percent pay premium. 40 day's paid vacation every year. And a chance to work on a teleprocessing network for the world's largest oil-producing company—a network that's in the process of growing from 800 to 1500 terminals.

Our advanced computer network is the absolute intelligence center for all of Aramco's many activities. Everything depends on it: exploration, production, refining, materials supply, engineering, finance, personnel, process control, and more.

Here are the highlights of the system: Two IBM 3033's, one 370/158, one 370/168. Smaller systems include an MVS/SE, JES2, TSO, IMS/VS and VTAM.

Aramco's regional teleprocessing network, running under IMS and TSO, will be growing from 800 terminals to 1,500 terminals.

That's why we need good EDP people like you.

The immediate openings

• **Analyst/Programmers.** We need you if you have experience in engineering, finance, power

systems, inventory control, purchasing, payroll, industrial relations. Requirements: a BS or a BA in physical science, computer science, engineering, math, finance or business administration. You should also have at least 3 years' experience, preferably in one or more of these languages: PL/I, IMS/DB/DC, ADF, MARK IV, COBOL, FORTRAN.

• **Systems Programmers.** Our Computer Science Division needs you to work on IBM 3033's running MVS/SE, JES2 and VTAM. Requirements: a BS or a BA in physical science, computer science, engineering, math, finance or business administration. You should also have at least 2 years' experience in one or more of these areas: MVS, JES2, VTAM.

Unsurpassed compensation and benefits

The Aramco salary is competitive and a cost-of-living differential increases it even further. In addition, Aramco people in Saudi Arabia receive a tax-protected premium which can amount to up to 40 percent of the base salary.

Money aside, Aramco offers an outstanding combination of benefits, including the long va-

cation, comfortable housing, abundant recreation, and an excellent American-style school system for the children.

Extra overseas bonus and new voluntary "bachelor" status for married employees

Newly hired employees for Saudi Arabia also receive a one-time, lump-sum, fully tax-protected Overseas Employment Bonus of up to \$5,000.

And now all of the attractive compensation and benefits are available for married employees who may want to work overseas on a temporary "bachelor" status for the first year. This program includes three free repatriation trips by air during this one-year period, and the option to request family status at three conversion dates during the same year.

Interested? Call our 24-hour line any day: (713) 750-6965. If you wish, call toll-free: (800) 231-7577, ext. 6965 between 7 A.M. and 5 P.M., Monday-Friday, Central Time.

If you prefer, send your résumé in full confidence, or write for more information to: Aramco Services Company, Department CW0126NB04B, 1100 Milam Building, Houston, Texas 77002.

CHALLENGE BY CHOICE**ARAMCO**

SERVICES COMPANY

ROBERT HALF

DALLAS

Several high visibility positions avail-
 able for people with two years IBM OS-

COBOL programming skills utilizing

CICS; \$24,000.

Several North Texas based clients

need sharp individuals with at least two

years IBM System 3 or 34 experience.

Some of these are start-up positions.

TO: 524-2444

• **CONTACT:** John Steiger

Robert Half of Dallas, Inc.

Two NorthPark East, Suite #750

Dallas, Texas 75231

(214) 383-3300

CALL COLLECT

• • • • • • • • • •

SYSTEMS ANALYST/MANAGER

Central Oregon Community College

Eastern Cascade Bld & Reservation Area

2 yrs. experience in systems analysis

in business-type environment + 1 yr.

business-type Applications Programming

preferably using BASIC, PASCAL or FOR-

TRAN, and/or programming experience in

Computer Operations Systems Pro-

gramming. Experience with PDP 11 com-

puters using RSTS/E, familiarity with col-

lege administrative applications, and/or ex-

perience working on systems using

data base concepts HIGHLY DESIRABLE

Degree in Business or Computer Science,

formal schooling in systems techniques,

programing and data processing concepts

or equivalent training experience. A

PLUS. Starting salary: \$20,350-\$23,552/yr.

+ fringe. Deadline for applications and

interviews is January 31, 1981. Call or write to:

Human Resources Department, Central

Community College, 1200 NW College Way, Bend, OR

97701, (503) 382-6112, ext. 221. EEO/AA

EMPLOYER



**SYSTEMS PROGRAMMERS
 IMS SR. PROGRAMMER
 ANALYSTS**

**call Jona Hester
 (213) 887-5039 collect**

or send resume to Jona Hester



**MELLONICS
 INFORMATION CENTER**

6701 Variel Ave., Canoga Park, CA 91303

Equal opportunity employer M/F

position announcements

position announcements

position announcements

position announcements

position announcements

Your Ultimate Choice

MOST CHALLENGING START-UP IN DATA PROCESSING HISTORY YOU CAN BE A PART OF IT

M. David Lowe has been retained to staff the largest start-up operation in data processing history - a major computer center to support our Saudi Arabian client's geophysical research and development effort. Top managers have been brought in from around the world, and they are ready to begin selecting a staff that will change the meaning of "state-of-the-art" software. Consider the opportunities:

MONEY ...

... Net income after all expenses will be greater than your current U.S. gross income, i.e., if your current base salary is \$30,000, you can plan to bank \$35,000.
... includes a 10% cash bonus upon acceptance and a 40% expatriate bonus.

TECHNICAL OPPORTUNITIES ...

... 1981 hardware will be twin IBM 3033s, with the five year plan calling for multiple 3081s (unless IBM develops something more powerful).

... Latest generation IBM operating system.

... Worldwide telecommunications network.

... Largest variety of geophysical and petroleum engineering development projects in oil industry history.

TRAVEL ...

... Forty days vacation the first year, plus a tax protected trip to your point of origin. This time and money can be used to see Europe, Africa, the Far East, or any of the other easily accessible spots company personnel frequently visit.

... If you are married, but elect to go single status, the company will give you three tax sheltered trips home each year.

... There are ample opportunities for transfer to American and European locations for tenured employees.

LIVING CONDITIONS ...

... Family or single status American style living.

... Only hospital in the Middle East accredited by the North American Hospital Association.

... American style grocery store.

... Schools that produce an average score in the 90th percentile on U.S. achievement tests.

**ALL FEES ASSUMED BY CLIENT COMPANIES
NEVER A CONTRACT TO SIGN**

M. David Lowe
PERSONNEL SERVICES

476 Houston Natural Gas Building
1200 Travis

Houston, TX 77002

EOE

A NEW APPROACH AT COCA-COLA USA Manager - Decision Support System

The continued growth of our headquarters facilities in Atlanta has created a new position within our Management Information Systems Department. Unlike the traditional data processing jobs, this position will uniquely blend an individual's managerial, technical, business and creative skills. The position will allow the selected candidate to develop a staff that will be responsible for the planning and implementation of top management requests for information. The person's primary responsibility includes developing broad based decision support systems that are data base oriented for problem analyses or strategic planning in the areas of finance, distribution and marketing.

We are looking for a candidate who can meet the following requirements:

- Degree on the graduate level with 3-5 years of related professional experience.
- Experience in using modeling, financial and/or marketing planning techniques on IBM hardware.
- Ability to approach problems as a business person.
- Excellent communication skills.
- Experience in management and staff development.

This is a challenging slot that will afford the right individual an opportunity to make an outstanding contribution to our organization.

We offer an excellent income commensurate with your experience and generous benefits package. For immediate and confidential consideration, please forward your resume with salary history to:

Department R

Coca-Cola USA

A Division of The Coca-Cola Company

Employment/Placement Office
P.O. Drawer 1734
Atlanta, Georgia 30301



An Equal Opportunity Employer M/F/Hdc/V

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's
Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell Ads. Available upon request: Software Wanted, Turnkey Systems and Real Estate.

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are \$84.70 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs \$169.40 per insertion. Extra space is available in half-inch increments and costs \$42.35. Box numbers are \$10.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired:
_____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____

Title: _____

Address: _____

Telephone: _____

Send this form to:
**CLASSIFIED ADVERTISING,
COMPUTERWORLD**

375 Cochituate Road
Route 30, Framingham, MA
01701

Senior Programmer

A leading computer design and manufacturing corporation in the field of CAD/CAM seeks a Senior Programmer. Duties include: heavy involvement with an N/C post processor, including the preparation of technical documents to customer specification, simulating machine situations with interactive graphic system, testing and maintaining N/C post processor according to new versions of systems packaging and creation of adaptive control systems and machinability sub-overlay. Minimum requirements include MS in Mechanical Engineering with 1 year experience as assistant engineer level in the area of manufacturing and machine tools; knowledge of N/C machine tools and their programming in APT, knowledge of manufacturing processes and engineering design/drawing; ability to program in FORTRAN/BASIC; apply high-level mathematical and documentation skills. Salary \$20,000 per year.

Please send resume to Joseph Sommers, Computervision Corporation, 201 Burlington Road, Bedford, MA 01730. An Equal Opportunity Employer.

SYSTEM ANALYST

(Data Processing Manager)

MA in Computer Science or BA in Computer Science with experience. Experience with DEC PDP II family; good understanding of Basic language. Knowledge of medical or health facilities MIS preferred. Experience in supervising a Data Processing Center Operations. Ability to perform job cost analysis; ability to design computer systems request from non-technical users. 8:00 AM to 5:00 PM Monday through Friday, some weekends and some nights. For more information call 512-447-4141 at Austin-Travis County Mental Health Mental Retardation Center, 1430 Collier, Austin, TX 78794 or call (512) 447-4141 Ext. 26.

EOE

UNIVERSITY OF HARTFORD

Invites applications and nominations
for the position of

DIRECTOR OF ACADEMIC COMPUTING

The University of Hartford is an independent, coeducational, non-sectarian urban university, founded in 1877. The University is located in Connecticut, minutes from downtown Hartford, on an attractive 200-acre campus. It consists of eight colleges, offering over 70 major areas of concentration in liberal arts, engineering, business, education, music, art, and electronic technology. Approximately 4,200 full-time day undergraduate, 3,200 part-time day and evening undergraduate, and 2,800 full- and part-time graduate students are enrolled at the University. Of these, 1,800 reside in modern dormitories filled to capacity.

The University of Hartford has recently ordered a Digital Equipment Corporation VAX 11/780 computer system. In addition, a new computer center is planned for construction in the near future. We seek a dynamic and competent individual to provide the necessary leadership to develop and direct an academic computing facility. This Director will report to the Provost and work with an Academic Computing Advisory Committee. The requirements for the position include:

- Master's degree required - Ph.D in appropriate discipline preferred. A faculty appointment is possible.
- Experience with the operation of an academic computer center.
- Experience with DEC equipment and/or VAX 11/780 computer preferred.
- Ability to organize and run faculty workshops.
- Knowledge of several computer languages and educational software packages.
- Good sense of humor and effective interpersonal skills.

Applications including a resume, description of present position, and three references should be received by May 15, 1980. Respond to:

Dean James S. Vinson
College of Arts and Sciences
University of Hartford
West Hartford, CT 06117

An equal opportunity, affirmative action employer

ASSOCIATE DIRECTOR VIRGINIA TECH COMPUTING CENTER

The Virginia Tech Computing Center has an IBM 3022, an IBM 370/158 AP, an IBM 4341, and a Honeywell 88/60 Multics System. The Associate Director will be part of the senior management team of the Center.

Duties to include interaction with instructional and research faculty on needs ranging from special purpose laboratory mini and micro computers to large scale batch, interactive computing, and word processing. Position is primarily administrative, but can provide for a limited amount of instruction and/or research activity. If so desired, Preference will be given to candidates with a Ph.D. in Computer Science, Engineering, or related field. Management experience in a large computing center is considered essential.

Salary for this position is open and commensurate with the selected candidate's qualifications and experience. Reply in confidence with resume and salary expectations to:

Dr. Vinod Chachra, Director
University Computing Resources
113 Burruss Hall
Virginia Tech
Blacksburg, VA 24061
(703) 432-4811

Virginia Tech is an Equal Opportunity/Affirmative Action Employer.

position announcements

ROBERT HALF

- SUMMIT ENERGY OPPORTUNITIES FOR PROGRAMMERS/ANALYSTS
- APL USER INTERFACE \$36K
- COBOL 370/CICS \$25K
- DATA PROCESSORS \$24K
- RPCII SYS 34 \$24K
- RPCII 370 \$24K
- Many other energy positions available offering excellent benefits & full relocation packages. FEE PAID.

JERRIE BROWN
ROBERT HALF
135 St. Al. Louisiana
135 St. Al. Louisiana
New Orleans, LA 70136
(504) 524-3773

Computer Programmer

Salary based on education and experience. Benefits include: Health Insurance, Retirement Plan, Paid Vacation, Paid Holidays, Paid Sick Days, and more. Requirements: Minimum of one year of experience in computer programming. Experience in programming using BASIC+ and some business applications programming experience required. Knowledge of interactive terminal oriented computer systems preferred by DEC PDP-11 Series. Apply to Director of Personnel, Arizona Western College, P.O. Box 929, Yuma, AZ 85384 or 803/725-1900, ext. 223. Equal Opportunity Employer

SYSTEMS & PROGRAMMING SPECIALIST

Five years ANSI COBOL programming experience plus one year systems analysis and design. Working knowledge of Data Base Mgt. and Datacommunications. Salary \$2069-\$2514 per month plus good fringe. Send resume by Feb. 2, 1981 to R.K. Petrak, Personnel Coordinator, Torrance School District, 2335 Plaza Del Amo, Torrance, CA 90509 213/533-4251.

Find Yourself, a job in the classified pages of Computer-world.



COMPUTERWORLD

DATA PROCESSING MANAGER

We are a growing progressive manufacturer of precision electronic instruments located on the northwest side of Chicago. We are seeking a shirt-sleeves professional with strong abilities to guide and supervise a staff of 6 programmers/analysts. Because of the complexity of our systems, you must have strong technical capabilities in manufacturing and financial applications, using a 370/138 IBM DOS system. You must have demonstrated an ability to lead and help other programmers in the solution of sophisticated programming problems. ANSI Cobol is our basic language and we also use DBOMP and WESTI. Since top management is vitally interested in our management information system, you must be able to communicate on a daily basis with them.

In return, we can offer you a dynamic atmosphere where your efforts and successes will be highly visible and amply rewarded.

This position is accompanied by an excellent salary as well as a complete fringe benefit package. To arrange a confidential interview, send your resume with salary history and requirements, to:

BOB RIEFKE

Beltone
ELECTRONICS CORP.

4201 W. Victoria
Chicago, IL 60646

An Equal Opportunity Employer M/F

THE SPOTLIGHT IS ON YOU...

The spotlight is on you! Are you looking for an opportunity where you can be a star performer, center stage? Join Sperry Univac's Mini-Computer Operations...where the individual counts, is listened to, makes the difference, determines the program success. We'll listen...to you...to your ideas...developing innovative solutions to our very complex technical projects. Enjoy the benefits of being a member of Sperry Univac, long recognized as an innovative leader in the computer industry. Work within the individually-oriented atmosphere of our Mini-Computer Operations in Orange County, California. We are launching a major new thrust in our mini-computer systems and are seeking key individuals at all levels to join our Software Development team.

BREAK INTO THE MINI-COMPUTER FIELD by joining our software team to provide technical expertise outside the development organization and solutions to customer installed systems. With a willingness to learn about new products, you will gain a broad background in overall mini-computer software design and applications. BS degree in Computer Science required.

SHARPEN YOUR KNOWLEDGE OF DATA MANAGEMENT ARCHITECTURES by participating in the specification, design and implementation of a state-of-the-art, hierarchical file system. Discover how to integrate this system with the I/O and database management systems. BS degree in Computer Science required and minimum 5 years experience in systems design.

EXPAND YOUR OPERATING SYSTEM BACKGROUND to include our growing V77 mini-computer family. Work within our interactive, Pascal development environment to design and implement major new OS modules: scheduler/dispatcher, I/O resource management and memory management systems. BS degree in Computer Science required and minimum 3 years experience in operating systems.

STRENGTHEN YOUR SOFTWARE ENGINEERING SKILLS by having responsibility for defining user needs and writing statements of requirements in the area of configuration management and software development tools. Will lead a project team to implement tools defined. BS degree required in math or computer science and minimum 8 years experience to include mainframes. Also, a position is available with responsibility for developing, documenting and testing tools to be used during the software development process. Requires a BS degree in math or computer science and at least 4 years software development experience.

HEIGHTEN YOUR ABILITIES IN PRODUCT TEST AND ASSURANCE. You will design and develop tools to be used in assurance testing and performance measurements. Requires a bachelor's degree in computer science or math and 5 years experience including knowledge of machine language and operating systems.

ADVANCE TO A SORT/MERGE PROJECT LEADER in our programming languages area. The position involves project leadership developing a new sort/merge package to support new ANSI COBOL and stand alone requirements. The individual will have a strong technical background in sort/merge technology with at least 8 years experience, including 5 years in systems programming.

Our Software Development organization is heavily team oriented and is looking for key members who are eager to accept responsibility and move quickly into lead technical and managerial roles. Come, work with a team that is action oriented, and enjoys responding to a technical challenge. Interact with hardware developers to formulate new systems architect concepts and design.

A position with Mini-Computer Operations offers you a stable, rewarding career, accompanied by a compensation package that is second to none in the industry, and includes free dental insurance, 10 paid holidays as well as a comprehensive medical and life insurance plan. Submit your resume and salary history in complete confidence to the address below, or phone our Employment Department at 714/641-7916 for additional information regarding these exciting career opportunities.

SPERRY UNIVAC

MINI-COMPUTER OPERATIONS
2722 Michelson Dr. • Irvine, CA 92713

A Division of Sperry Corporation and an equal opportunity employer M/F.

Data System Supervisor

Erlanger Medical Center located in historic Chattanooga, Tennessee, is expanding its data processing operations as part of its long range system plan for an integrated medical information system utilizing main frame and mini-computer systems. We are seeking a "take charge individual" with supervisory experience and a background in programming and operations of small scale and mini-computer systems. This individual will be responsible for supervising the daily activities of our data entry operations and upgrading our Phase Four IV-90 system to utilize concurrent processing in an MFE environment running VISION, WORD PROCESSING, OMS AND COBOL SYSTEMS. If you have Four Phase similar systems experience this may be the ground floor opportunity for you. We offer a great deal in addition to no state income tax and the warm hospitality and tradition of the south you will find a comprehensive benefits package and an outstanding opportunity for personal and professional growth. Don't delay. Submit a copy of your resume to:



Director - Data Systems
Erlanger Medical Center
975 East 3rd St.
Chattanooga, TN 37403

WYOMING
TELECOMMUNICATIONS/MINICOMPUTERS
PERFORMANCE ANALYSIS

The University of Wyoming has an immediate need for a Telecommunications/Minicomputer Specialist in the Division of Computer Services. The person in this senior level technical position will be responsible for planning, coordinating, procuring, documenting and implementing all telecommunications activities for the University Computer Center. Additionally, this person will provide advice to University personnel regarding the best solution to their computational needs, and will be responsible for computer performance analysis.

The University has recently installed two large CDC CYBER computers which serve the campus and remote locations with batch and timesharing facilities. Currently, over 300 timesharing terminals are connected to this multi-mainframe system.

If you have at least six (6) years of progressively responsible computer experience, with a substantial portion related to minicomputer systems and telecommunications problem solving, some experience on large-scale mainframes, and a bachelor's degree in a computer-related field, we invite you to apply for this position. Good verbal and written communications skills are also essential.

The University, located in Laramie (population 25,000), enrolls 8500 students in a full range of Doctoral, Master, and undergraduate degree programs. We offer a competitive salary, commensurate with experience and education, and a full range of University benefits with this position.

If you would like to join us in this challenging position located in the Rocky Mountain region, please direct your resume (or inquiries) to David A. Haas, Manager, User Services & Academic Programming, Computer Services Division, University of Wyoming, P.O. Box 3645, University Station, Laramie, WY 82071. Telephone 307-779-4880.

The University is an active Equal Opportunity/Affirmative Action Employer.

position announcements

position announcements

position announcements

position announcements

position announcements

Rexham Corporation, a Charlotte based manufacturing firm listed on the NYSE, is expanding its Corporate Data Center to meet increasing user demand for high quality on-line systems. This expansion has created positions in the following categories:

SENIOR SYSTEMS ANALYST

Manage a small project team of programmers and analysts to develop and support on-line manufacturing systems written in ANSI 74 COBOL.

SENIOR PROGRAMMER ANALYST and PROGRAMMER ANALYST

Design, code, test, and implement major on-line manufacturing systems through direct interaction with users.

SENIOR SYSTEMS PROGRAMMER

Development and support of systems software in BAL as a member of strong technical support group.

These positions require at least 2-5 years' experience in development of on-line systems, based on the level of the position, and in general, have the following additional requirements:

- strong math background, with BA in Math, Computer Science, or Engineering; Master's a plus;
- skill in systems design, architecture, and user communications;
- considerable experience and facility with the ANSI 74 COBOL language (except Senior Systems Programmer);
- strong orientation toward technical competence;
- experience in the IBM 370/OS and/or UNIVAC 90/60-80 VS/9 environment.

As a member of this small core of computer science professionals, you will enjoy the challenge of working in an environment where technical skills are highly valued and rewarded. Our Data Processing Group is young and growing, through the sound development and implementation of high quality systems. The user and management relationship is very positive and productive, with considerable room for the creative individual. Our hardware environment is a UNIVAC 90/60-3 running VS/9 in support of over 50 on-line terminals, with movement toward distributed computing systems for some remote sites.

We offer competitive salaries and excellent benefits, including relocation reimbursement. Interested individuals are requested to send a resume, including salary requirements and position preference, in confidence to:

Personnel Manager

Rexham CORPORATION

P.O. Box 4068, Charlotte, N.C. 28204

An Equal Opportunity Employer M/F

SOFTWARE SALES AND SALES MANAGEMENT OPPORTUNITIES. CANDLE CORPORATION - The Developers of OMEGAMON.



Candle Corporation is growing rapidly. With this growth, a number of positions have opened in the Sales and Sales Management areas. The positions work with accounts which are located throughout the country. However, emphasis is being placed on finding people who are located in, or are willing to re-locate to Los Angeles or Orange County, California. Travel is not required.

DOS

Performance Monitoring Software Sales Representatives. Must have 2-5 years of software selling experience in the DOS market. Excellent salary, commission structure and advancement potential.

MVS and CICS

Performance Monitoring Software Sales Representative positions open for Sales Reps, Senior Sales Reps and Account Managers. Should have MVS or CICS experience. Excellent salary, commission structure and advancement potential.

SENIOR LEVEL SALES MANAGER

Must have 5 to 10 years experience in Software Sales and Sales Management. In-depth knowledge of the DOS, MVS and CICS Marketplace. International experience a plus. Excellent executive compensation package. Advancement potential to V.P. of Sales possible within two years.

Excellent income, personal success, advancement opportunities and professional growth are available at Candle.

Write or call:

Richard Galea
Candle Corporation
4676 Admiralty Way, Suite 624
Marina del Rey, CA 90291
Phone: 213-821-2902

A-63

PROGRAMMER ANALYST

CNL, a rapidly growing computer service bureau with heavy emphasis on software development and sales is looking for an experienced Programmer/Analyst. Minimum of 3 years experience with RPG II in an on-line environment. Salary \$28K+. If you are interested in a ground floor opportunity to join a rapidly growing company send your resume to:

Curtis L. Brown, President
COMPUTER NETWORK LTD.
P.O. Box 443
Farmington, MO 63640
314/756-4555

EDP SALES MANAGEMENT

Fox-Morris, nationally recognized as the leader in Data Processing sales/marketing placement, has current opps with top quality, rapidly growing client co's including:

Software National Sales Mgr.- Phila	\$70-75,000
Small Computer Sales Mgr. Dealers-Phila	\$65-70,000
Data Commun. Regional Mgr-Chicago	\$55,000
Telecommunications Sales Mgr-Phila & Boston	\$55,000

Client co's pay all costs. Contact, in conf, Don Owens, 215-561-6300, FOX-MORRIS PERSONNEL CONSULTANTS, 1500 Chestnut Street, Phila., PA 19102.

Dallas

System Software Personnel

Billion dollar electric utility company with centralized data center has immediate need for persons within the rapidly expanding corporate Information Services Department to test and install new or modified systems software.

Positions at multiple levels offer growth potential for professionals demanding challenge and opportunity. Present staff expanding to support installation of second 3033 with **MVS/SPI and 2** as well as 4300 distributive process network.

Present state-of-the-art IBM 3032 environment is **MVS/SE2, ACF/VTAM** with 600 CICS, ROSCOE, and TSO terminals.

Mail resume and salary history to Employee Relations Division, Management Recruiting Department.



Central and South West Corporation

2700 One Main Place • Dallas, Texas 75250

Equal Opportunity Employer

We are seeking to fill

518 EDP Job Openings in the San Francisco Bay Area

You'll find little evidence of recession in the computer careers market in the San Francisco Bay Area. Growth continues at a rapid and steady pace, with heavy demand at all levels for qualified EDP personnel. Our client companies pay all fees, interview and relocation expenses: The Computer Resources Group, Inc., is a long-established (9 years), highly respected (150 leading companies utilize our services), and alert organization (our data bank of computer professional needs is unmatched in the San Francisco area).

Send us your resume today or call collect.

**COMPUTER
RESOURCES
GROUP INC.**

303 Sacramento Street, San Francisco, CA 94111
(415) 368-3535 or 3333 Bevers Avenue, Suite 130
Santa Clara, CA 95051 (408) 727-1658
AFFILIATES IN 25 MAJOR U.S. CITIES

A employer-retained professional placement service

DATA PROCESSING

Rare opportunities exist in the Denver headquarters of a national cable television operator to contribute to the development and future growth of a centralized IBM Computer Center. Positions currently available include:

PROGRAMMER ANALYSTS

COBOL, IBM OS and DOS, JCL and RJE background and 3-5 years programming experience required. College degree and conversion experience highly desirable.

COMPUTER SYSTEMS ENGINEERS

Requires 3-5 years programming experience in real time or interactive environment. FORTRAN and ASSEMBLY language a must.

Company offers competitive salary and benefits package. Please send resume and salary history to:

Employment Manager
AMERICAN TELEVISION & COMMUNICATIONS CORP.

160 Inverness Drive West
Englewood, CO 80112

Equal Opportunity Employer M/F/H/V

position announcements

UNIVAC DMS 1100 ANALYST

Washington • New Orleans • Houston • Los Angeles

Exceptional opportunities, now exist with the premier DMS 1100 consulting firm. If you have the experience and technical credentials in DMS 1100 then you owe it to yourself, to investigate the advantages of being an associate of our firm. As a consulting associate you will enjoy working with your peers in challenging and stimulating assignments while receiving a liberal salary and excellent benefits. You're invited to submit your resume to Data Base Management Associates, Inc.

2820 West Maple

Troy, MI 48084

Attention: Mr. John Klimek

(313) 649-3119

Data Processing

Career Opportunities With Burroughs

Dramatic growth, expansion and internal promotions have created several excellent career opportunities for talented Data Processing Professionals with large systems software experience, preferably Burroughs B6000/7000 system.

Customer Demonstration

Minimum 2 years experience in

- Data Communications (DC ALGOL & NDL)
- Data Base Management Systems (DMS II)
- COBOL

Quality Assurance

Minimum 2-5 years experience in

- General business applications
- System software design and analysis

Burroughs provides excellent salaries and benefit programs and through our commitment to growth, we can provide you with the kinds of diversified, challenging positions that offer you the chance to work with an industry leader doing the kind of work you enjoy. Opportunities are available at our Paoli, Pennsylvania facility.

To apply, please send resume in confidence to:

Aileen Unger
Burroughs Corporation
P.O. Box 517, Dept. C-1-26
Paoli, PA 19301

WE'D LIKE TO HEAR FROM YOU!

An Equal Opportunity Employer, M/F

Burroughs**SALES ENGINEERS****NEW ENGLAND****To \$47K PLUS**

Several of our major blue-chip clients are currently in search of sales engineers to service technical, scientific and industrial markets in the New England area. Successful candidates will have 2-5 years sales experience in minis or micros, BSEE helpful but not necessary. Packages include high base plus commission, expenses and full benefits. Submit resume in confidence or call

B. Verity, Management Consultant

GRAY & STEELE ASSOCIATES

240 Commercial St.
Boston, MA 02109
617/742-1950

Bendix

Set Your Sights On The Future... With Bendix!

**Opportunity And Challenge Await You In Saudi Arabia**

Bendix Field Engineering Corporation, a world leader in the service industry, has been awarded a contract in Saudi Arabia to provide technical assistance to the Presidency of Civil Aviation in the Maintenance and Operation of the Saudi Airways Facilities Systems. We have immediate requirements for candidates who are interested in challenging opportunities with experience in one or more of the following areas:

DATA SYSTEMS SPECIALIST

Requires BS or equivalent and six or more years experience related to computer software support for Air Traffic Control automation system and facilities.

COMPUTER PROGRAMMER ANALYST INSTRUCTOR

Requires a Bachelor of Science degree or equivalent and 5 or more years experience, of which 2 years must have been in programmer training, related to general computer programming or real-time data processing systems using Assembly language.

DATA PROCESSING INSTRUCTORS

Requires a Bachelor's degree in Electrical/Electronic Engineering and 2 or more years of training experience related to the preparation of training material and formal classroom instruction in data processing equipment.

DISPLAYS INSTRUCTOR

Requires a Bachelor's degree in Electrical/Electronic Engineering and 2 or more years of training experience related to the preparation of training material and formal classroom instruction in Alphanumeric radar displays.

DISPLAYS TECHNICIANS

Requires formal training and 3 years experience in Radar Display systems utilizing CRT digital displays and scanning displays.

DATA PROCESSING TECHNICIAN

Requires formal training and 3 years experience in high speed digital/analog electronic computers, microprocessors, data processing, data transfer, mpa and alphanumeric generator and display interface systems.

BENDIX offers competitive salaries, liberal fringe benefits, free housing, (some family accommodations), annual and rest and relaxation leave, hardship allowance and completion bonus. If interested, please submit resume in strictest confidence to:

Mr. Bill Stover
Professional Placement Office, Dept. ATC
Bendix Field Engineering Corporation
Subsidiary of The Bendix Corporation
9250 Route 108, Columbia, Maryland 21045

An Equal Opportunity Employer M/F

Field Engineering Corporation**Information****Systems Director**

Management, development, fiscal operating regional data processing center (IBM 370-145) serving internal department and 12 school districts. Supervise staff of 15. M.A. in administration, training in systems analysis, design, programming, data processing standards. Minimum 5 years experience, 3 in management of electronic information systems. Salary minimum \$31,150. Request application: Inglenook Intermediate School District, 2830 West Howell, Muskegon, MI 49444. 617/878-3288.

SR. SYSTEMS PROGRAMMER/ANALYST

Join the corporate data processing staff at National Health Laboratories in Dallas TX. Design, program, and install on-line data systems nationwide, utilizing Digital Equipment computers. Requires college degree, preferably in Computer Science and 4 years experience. Desire mini-computer experience. Send resume to:

National Health Laboratories, Inc.
10300 N. Central Expressway
Meadow Park Central IV, Ste. 220
Dallas, TX 75231

position announcements

position announcements

position announcements

position announcements

position announcements

Data Processing Professionals:

WALL STREET IS TAKING STOCK IN OUR GROWTH SO SHOULD YOU!

It is no surprise that National Medical Enterprises has become one of the leading innovators in the health care industry in just 11 years. What is surprising is their incredible rate of growth which has far surpassed any previous expectations.

And that's good news for DP Professionals because NME is currently undergoing their most ambitious expansion to date and they're looking for top professionals who can take an active role in the expansion and development of the Data Processing Operations. NME has current needs for a:

PROGRAMMING MANAGER**DATA COMMUNICATION ADMINISTRATOR****MICROFICHE OPERATOR****APPLICATIONS PROGRAMMER****COMPUTER OPERATOR****PRODUCTION CONTROL CLERK****SENIOR SYSTEMS ANALYST****OTHER POSITIONS ARE PERIODICALLY AVAILABLE**

The candidates we seek must have academic and practical training as required by their particular area of expertise; familiarity with COBOL, IBM DOS/MVT equipment where appropriate, is a must.

Located in Los Angeles, NME offers an excellent compensation package including a competitive salary. We are an aggressive company on the move, so if you're looking to become a member of a result-oriented team, submit your resume to:

Corporate Employment Manager - Dept. R-100
National Medical Enterprises, Inc.
11620 Wilshire Blvd., Suite 740
Los Angeles, CA 90025

"The Total Health Care Company."

An Equal Opportunity Employer M/F

NATIONAL MEDICAL ENTERPRISES, INC.

GREAT SALARIES • OUTSTANDING BENEFITS
ADVANCEMENT OPPORTUNITIES • GROWTH POTENTIAL
LUXURIOUS FACILITIES • RECOGNITION & AWARDS • CAREER
RIES • HIGH-MORALE WORK ENVIRONMENT • SECURITY & STABILITY
OJECTS • CAREER SATISFACTION • CHALLENGING PROJECTS
E • RECOGNITION & REWARDS • STATE-OF-THE-ART HARDWARE

For a satisfying and rewarding career that you've got to see to believe, come to Information Systems Division in Anaheim. The company that gives you the very best opportunities possible for career growth and achievement.

Right now, our large user base is expanding rapidly. As a result, we have exceptional career positions available for:

**PROGRAMMER ANALYSTS
SYSTEMS ANALYSTS****SR. PROGRAMMER ANALYSTS
SR. SYSTEMS ANALYSTS**

So, look into a career that's truly incredible. Please call us collect or send your resume to:



Carter Hawley Hale Stores, Inc.
INFORMATION SYSTEMS DIVISION

Albert Quintanilla
INFORMATION SYSTEMS DIVISION
P.O. Box 1075
Placentia, CA 92670
(714) 520-1864

Equal Opportunity Employer M/F

Computer Professionals

Rensselaer Polytechnic Institute, a prestigious, technologically oriented private university located in beautiful upstate New York is expanding its network of timesharing terminals and distributed mini/micro computers using the IBM 3033 system. We are conducting a search for experienced individuals to actively engage in the following areas:

SPIRES DATABASE SUPPORT SPECIALIST

Will assist users in the design of databases using the SPIRES database systems on the IBM 3033. Experience in design and support of database systems and consulting experience required.

ENGINEERING APPLICATIONS CONSULTANT

Will enhance and support engineering applications packages on the IBM 3033, and will consult with customers concerning their proper use. Experience with applications package support and familiarity with engineering applications software is desirable.

APPLICATIONS SUPPORT SPECIALIST

Will enhance and support academic applications packages using the IBM 3033. Experience with applications package support in a university environment is desirable.

USER EDUCATION COORDINATOR

Will organize a variety of short courses for users of the 3033 and will teach some of the courses. Teaching experience, programming experience, and familiarity with a university environment required.

NETWORK AND COMMUNICATIONS SPECIALIST

Will participate in the design, implementation, and support of a communications network using a mixture of "ether" and X.25 technologies, using the IBM 3033 as one of several hosts. Previous communications and network design experience is required.

COMMUNICATIONS SYSTEMS PROGRAMMER

Will participate in the support and enhancement of communications software interfacing high-speed asynchronous terminals and computers to the 3033, and in the extension of this software to serve as a local multi-node packet switching network supporting several intelligent hosts and network interface machines. Knowledge of DEC PDP-11 assembler language and previous experience with communications hardware and software required. Familiarity with Pascal and IBM 370 assembler language is desirable.

BS degree and 2 years related experience desirable. RPI offers salaries commensurate with experience and complete benefits package which includes advanced educational opportunities.

For immediate consideration, interested and qualified applicants should submit resume, three professional references and salary requirements to:

Thomas F. Molloy
Employment Manager
Rensselaer Polytechnic Institute
Troy, New York 12181

Rensselaer Polytechnic Institute

Equal Opportunity/Affirmative Action Employer

MANAGER OF DATA PROCESSING

Our Midwest manufacturing facility has an exceptional professional opportunity for an aggressive individual with 5-6 years of management experience in Data Processing. The qualified candidate will possess a strong background in manufacturing applications and previous exposure to an on-line interactive environment. A college degree is preferred.

Reporting directly to our MIS Director, you will be responsible for both systems development and operations. Sound oral and written communication skills are essential for effective interface and involvement at a variety of management levels.

In addition to professional growth in a state-of-the-art environment we provide a salary in the high twenties to mid thirties and comprehensive benefit program: Please send resume with salary history and requirements in complete confidence to:

CW Box 2482
375 Cochituate Rd., Rte. 30
Framingham, MA. 01701
equal opportunity employer m/f

position announcements

position announcements

position announcements

position announcements

position announcements

AMPEX EXPLODES!

with career opportunities

AMPEX is a world leader in the design and manufacture of professional audio and video tape recording equipment. At AMPEX, we house the latest state-of-the-art equipment in a stimulating atmosphere of creativity and professionalism. We start with top Data Processing professionals and work with them to further upgrade and advance their skills in the exciting world of data processing. At AMPEX, our emphasis is on personal career development. We currently have openings in our Data Processing area for the following:

Project Manager—Distributed Data Processing

You must have a minimum of 7 years' experience with large IBM mainframe equipment, and knowledge of manufacturing systems, 4300s, CICS, COBOL, and IMS. You will supervise a staff of 14 and be responsible for 5 locations. Sr. Programmer/Analysts positions are also available.

Sr. Data Base Analyst

Responsible for designing and developing IMS Data Base support and support programs. You must be familiar with DL/1 applications, IMS Data Base design, and large IBM equipment using Data Base applications.

DOS/VSE and MVS Sr. Systems Programmers

DOS/VSE Systems Programmers will support distributed network through SYSGENS network definitions, be involved with problem debugging, application consultation, and design assistance. Should be familiar with DOS/VSE, CICS and VTAM.

MVS Systems Programmers will support capacity planning, performance measurement, and tuning for large scale MVS systems.

Sr. Systems Analyst

In this capacity, you will define and implement systems, as well as develop integrated information systems on a worldwide basis. Some international travel is involved. To qualify, you must have 5 years' data processing experience, 3 in a policy making role in systems implementation, and good communication skills. (BS in Computer Science is preferred).

Located in the easily accessible South San Francisco Bay area, AMPEX offers a highly desirable benefits package, on-site employee recreational facilities and much more. We are an equal opportunity employer. You are encouraged to send your resume today to Danny Norman or call him collect at (408) 367-2103.

AMPEX

Ampex Corporation
401 Broadway
Redwood City, CA 94063
An Equal Opportunity Employer

Bring your IMS expertise to SPC's dynamically expanding State-of-the-Art IBM/OS environment.

SR. DATA BASE ADMINISTRATOR

San Francisco Peninsula

Be responsible for planning, designing and managing SPC's IMS Data Base, establishing and enforcing standards and controls to insure Data Base integrity and the orderly use and growth of our Data Base environment.

This position requires 2-3 yrs. experience as a Data Base Administrator with a technical knowledge of IMS DB/DC utilizing DL/1 and a conversance in IBM's data dictionary; BS/Computer Science preferred.

SPC is willing to pay an excellent salary for the right individual. Please send resume to **Marsha Underhill, SPC Communications, One Adrian Court, P.O. Box 974, Burlingame, CA 94010, (415) 692-5800, Ext. 4109.** An affirmative action/equal opportunity employer.



SPC *SPC Communications*

a Southern Pacific Subsidiary

Atlanta **Boston** **Chicago**
Cleveland **Columbus**
Dallas **Denver** **Detroit**
Florida **Hartford** **Houston**
Indianapolis **Kansas City**
Los Angeles **Milwaukee**
Minneapolis **New Jersey**
New York **North Carolina**
Philadelphia **Pittsburgh**
Rochester **San Francisco**
Seattle **Syracuse...and**
Washington D.C.

Computer Career Boom Towns

Wherever you work or wherever you'd like to work NCA can show you a wealth of exceptional computer opportunities that offer

you meaningful career advancement. Contact the NCA office nearest to you. Company clients assume our fees.

Atlanta: BAI Limited, 225 Peachtree St., Suite 1601-C, Atlanta, Ga. 30303 (404) 581-0040

Boston: Robert Kleven and Co., Inc., 3 Fletcher Ave., Lexington, Mass. 02173 (617) 861-1020

Chicago: Thos. Hirtz & Associates, 150 N. Wacker Dr., Suite 1700, Chicago, Ill. 60606 (312) 977-1555

Corporate Professional Staffing Systems, Inc., 4807 Rockside Rd., Suite 300, Cleveland, Ohio 44131 (216) 524-5500

Columbus: Michael Thomas, Inc., 65 E. Wilson Bridge Rd., Suite 201, Worthington, Ohio 43085 (614) 846-9926

Dallas: Electronic Personnel Consultants, 555 E. I-35 Freeway, Suite 550, Dallas, Texas 75240 (214) 661-8600

Denver: EDI Infinity, Inc., 6000 E. Evans Ave., Bldg. 2-111, Denver, Col. 80222 (303) 753-1788

Detroit: Electronic Systems Personnel, 3000 Town Center, Suite 2580, Southfield, Mich. 48075 (313) 353-5880

Florence: Electronic Personnel, Inc., P.O. Box 8577, Hollywood, Fla. 33024 (305) 434-6112

Hartford: Compass, Inc., 900 Asylum Ave., Hartford, Conn. 06105 (203) 549-4240

Houston: Career Consultants, Inc., 2000 South Post Oak, Houston, Texas 77056 (713) 626-4100

Indiansapolis: Computer Personnel Services, Inc., 107 N. Pennsylvania, Indianapolis, Ind. 46204 (317) 634-4712

Kansas City: Electronic Data Personnel, Inc., 7600 State Line, Suite 225-C, Prairie Village, Kansas 66208 (913) 642-1554

Los Angeles: Constellation Enterprises, 3200 Wilshire Blvd., Suite 1004, Los Angeles, Calif. 90010 (213) 631-1213

Milwaukee: EDP Consultants, Inc., 11430 W. Bluemound Rd., Milwaukee, Wis. 53226 (414) 475-0777

Minneapolis: Electronic Systems Personnel, 858 Twin City Federal Tower, 121 S. 8th St., Minneapolis, Minn. 55402 (612) 338-6714

New Jersey: System Search, 1040 Morris Avenue, West Orange, N.J. 07040 (201) 761-4400

New York: Total Associates, Inc., 7 Day Street, New York, N.Y. 10007 (212) 227-7370

New York, Upstate: CFA Associates Personnel, Inc., 2530 James St., Syracuse, N.Y. 13206 (315) 463-5225

North Carolina: DataMasters, Div. of TaskForce, Inc., Box 6888, Greenville, N.C. 27858 (919) 373-1461

Philadelphia: Electronic Systems Personnel, Inc., 207 Fox Lane, Wallingford, Pa. 19086 (215) 565-2920

Pittsburgh: Electronic Systems Personnel, 400 Lawyers Bldg., 428 Forbes, Pittsburgh, Pa. 15219 (412) 391-6450

San Francisco: The Computer Resources Group, Inc., 303 Sacramento St., San Francisco, Cal. 94111 (415) 398-3535

Seattle: Computer Resources, Inc., 1940 116th Ave. N.E., Bellevue, Wash. 98004 (206) 453-2700

Washington, D.C.: ESP Systems Corporation, 1211 Connecticut Ave. N.W., Suite 210, Washington, D.C. 20036 (202) 833-8040

National
Computer
Associates

LOOKING
for a job
in Juneau?
Look here in
Computer-
world's
classifieds.

COMPUTERWORLD



NEW YORK CITY,
DOMESTIC U.S.A.
AND
INTERNATIONAL OPPORTUNITIES

We have multiple openings for talented analysts and programmers. If you have at least four years experience and would like to join a fast track consulting firm with international opportunities, our specific requirements currently are:

New York City and International: Mark IV any OP System COBOL, TOTAL, ENVIRON/1

OS, COBOL, CICS OS, PL/I, IMS (db or dc)

If you feel you qualify, submit your resume in confidence to:

TANGENT INTERNATIONAL
COMPUTER CONSULTANTS, INC.
SUITE 8807 1 WORLD TRADE CENTER
NEW YORK, N.Y. 10048
TELEPHONE: (212) 938-0438

position announcements				
------------------------	------------------------	------------------------	------------------------	------------------------

SOFTWARE & HARDWARE PROFESSIONALS. JOIN THE EXCITEMENT.

Diversity of projects.
Team efforts and interdivisional technology transfer.

Enlightened and responsive management.

We've got it all at Harris Composition Systems in Melbourne, Florida.

The world's first and leading supplier of total word processing systems for use in the newspaper industry—we're now extending our "systems-oriented" approach into the office systems field.

If your expertise is in the following areas, get in on all the excitement.

MICROPROCESSOR SOFTWARE DEVELOPMENT

- 16-bit microprocessor
- High level language (PASCAL)
- Multi-tasking and multi-processing OS
- Telecommunications
- Data base management
- Data retrieval techniques

FIRMWARE DESIGN

- Writing programs to control or

operate intelligent interface, peripherals or other special functions within digital systems.

DIAGNOSTIC DESIGN

- Minicomputer and microprocessor based systems
- Stand alone (ROM resident confidence test) diagnostics
- On-line diagnostics interactive with OS
- Product/engineering specification

MANUFACTURING TEST ENGINEERING

- Automatic Test Equipment (ATE)
- Hardware/Software applications for in-circuit and functional testing of digital, analog and hybrid circuitry.
- Text fixture design
- System integration and peripheral test.

Send your resume and salary history to: Daphne Cumberland, Composition Systems Division, Dept. CW1/26, P.O. Box 2080, Melbourne, Florida 32901. Or call COLLECT: (305) 242-5321 in Florida. Outside Florida call 1-800-327-0482.



HARRIS
COMMUNICATION AND INFORMATION PROCESSING

An Equal Opportunity Employer M/F/V/H.



With the Help of
National Personnel Associates
The World's Largest Network of Professional Placement Agencies

Contact any one of the following NPA Affiliates:

Programmer/Analyst	\$22,000
IBM System 3 with CCP	\$23,000
Programmer/Analyst IBM 360/160 MVS with banking experience	\$23,000
SE, System-Designer/Analyst IBM 370/138 w/Cobol CICS	\$23,000
D.P. Manager System 315D CCP	\$31,000
Systems-Analyst IBM 370/158 DOS/VSE, CICS	\$33,000
Call collect or send resume (815) 328-1771 Ann Barker	
DEALY ROURKE PERSONNEL SERVICE, INC. 1800 West End Blvd., Suite 121 Nashville, Tennessee 37203	

FLORIDA

UNPOLEO BEACHES AWAIT YOU

PROGRAMMER ANALYSTS 04 or 05

- Cobol, DL-1 to \$27K
- BAI, Cobol to \$25K
- VM, PL-1 to \$25K
- NCR Head/3 Level 2 to \$24K
- V3/CICS strong BAL to \$27K

SYSTEMS ANALYSTS

- Cobol or BAL, Financial Banking, Life Ins, Mig to \$30K

SOFTWARE

- Systems Programmers to \$35K

DATA ANALYSTS

- IMS, IDMS, TOTAN to \$35K

AVAILABILITY SPECIALIST

- 813-873-8551

- Dept. CW, P.O. Box 25434

- TAMPA, FLORIDA 33693

Hardware, software, problems, people, pricing, ethics, litigation, communication, macros, minis and micros.

We like to make an issue of it.
EVERY WEEK.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

375 Cochituate Road, Framingham, MA 01701 (617) 879-0700

SUNBELT OPPORTUNITIES

Call collect (404) 955-4221

Sys. Anal - CICS, MVS	\$35K
Sys. Anal - MACRS, CICS, ASSEM	\$30K
Sys. Prog. - COBOL, DB2, DB/2	\$30K
Database Admin. - IMS, DK Design	\$30K
Sys. Anal - 3031, MVS & COBOL	\$32K
Bank. Exp. - COBOL, ASSEMBLER	\$25K
Techn. Exp. - 3434, COBOL	\$30K
FORTRAN	\$30K
Prog. Anal. - VMS/370 & PL/I	\$23K
Proj. Lead. - MICRO Eng. & Analysis	\$23K
Sys. Prog. - V81, CICS & VM	\$28K
Sys. Prog. - DOS/VSE, COBOL	\$23K

National Personnel Recruiters, Inc.

8220 Powers Ferry Rd., Bldg. 150

Atlanta, Ga. 30339

Tech. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

Sys. Anal-370, COBOL, CICS 32K

EDP Auditor-internat'l travel 30K

Opns. Mgr.-370, superv. 8 28K

D.P. Mgr.-Sys/3/44, RPG-II 26K

Sys. Anal-Honeywell, lin 25K

Bus. Anal-Disk 24K

Business Analyst - DEC POP.11, RX11R 24K

Programmer-COBOL, CICS, VSAM 21K

Trainees-(Several) C.S. deg 16K

Techn. Prog. Mgr.-As4341, Fortran 35K+

Sr. Sys. Anal-Mgr. diag 32K

Distr. Anal-proj. exp 32K

position announcements

position announcements

position announcements

position announcements

position announcements

PROMOTE YOURSELF

IMS DB/DC DESIGNER

Major INDEPENDENT ENERGY client is seeking an experienced professional with the following qualifications: (1) BA/BS in Physical Science, Engineering, or Business, (2) IMS DB/DC DESIGN experience, (3) Language proficiency in either COBOL, PL/1, or ALC, and (4) at least five years of computing experience. A knowledge of MARK IV and ADF would be very helpful but not necessary. The successful candidate will act as TECHNICAL ADVISOR to Applications Development Teams.

Houston Positions To \$45,000
Foreign Positions Package To \$95,000

All Fees Assumed By Client Companies
Interview and Relocation Expenses Paid By Client Companies



ADDINGTON & ASSOCIATES
PERSONNEL SERVICES, INC.
6371 Richmond Ave.
Houston, Texas 77057
(713) 780-8810

NEW YORK

Technical Planning Managers (3)

To \$40,000

- 1) OPERATING SYSTEMS (MVS)
- 2) TELECOMMUNICATIONS
- 3) DATA BASE

Billion \$ concern with multi-divisional data centers seeks 3 Managers for its corporate systems planning group. Each represents the opportunity for a very good technical specialist to move into management. Attractive experience would include the following:

- Systems programming with OS/VS-2 (preferably MVS), OS/VS-1 or VM 370.
- Hardware/software evaluation, upgrade planning, conversion, capacity planning, and performance measurement.
- Planning & implementation of telecommunications hardware &/or teleprocessing software (preferably CICS & VTAM) and/or data base management systems (preferably IMS).
- Communication skills and ability to work with various levels of management.
- Leadership qualities to work independently on projects, manage task forces & head committees.

**the
jarvis walker
group**

535 Fifth Avenue
New York, N.Y. 10017
(212) 867-2650

COBOL Business Systems PROGRAMMER ANALYST

For a consulting civil engineering firm. Prefer degree in business or computer science with a minimum of 2 years' solid practical experience. Data base and HP 3000 experience highly desirable.

FAY SPOFFORD & THORNDIKE, INC.

Personnel Department
One Beacon Street, Boston, MA 02108
523-8300

Applicants will be considered on the same basis without regard to race, color, religion, sex, age, or national origin.

An equal opportunity employer M/F



SPERRY UNIVAC

SYSTEM PROGRAMMERS Put Your Career First... With A #1 Computer Company

Sperry Univac, the company whose innovations have placed us on the leading edge of technology, is committed to providing talented employees with the best in careers. Our commitment to hiring the best is one of the reasons we have maintained our reputation for quality. Because we emphasize teamwork and the free flow of ideas at all levels, talented people are quickly recognized and rewarded. Our continued growth has created openings for Programming professionals in the following areas:

Systems Programmer

- Univac 1100 Series DMS/CMS/TIP (Internals)
- Univac 1100 Series EXEC VIII Operating System (Internals)
- Univac 1100 Series—Processor Support (COBOL, FORTRAN & EXEC)

Data Communications Analysts

- DCP-40 Telcon experience (Internals)
- Data communication network design (Large Scale)

Conversion Programmers

- Programmers experienced in conversion of any type of computer systems software to the Univac 1100—Using COBOL or Assembly Language. Experience in converting from a Burroughs 3500 systems environment to the Univac 1100 Series a great plus.

These positions are available in Huntsville, Ala., or Washington D.C.

Here at Sperry Univac we offer career opportunities that stand second to none for level of technical challenge, interest and chance for immediate involvement. We're proud of our professional team's achievement, and now look to you, the talented individual to join our expanding organization. We are ready to offer you competitive salaries, excellent company paid benefits and the prestige of working for the industry's #1 computer company.

For further information please send your resume or call collect:

Rodney S. Smith
Sperry Univac-FPO
303 Williams Ave.
Huntsville, Ala. 35801
205-539-5191

Sidney Yee
Sperry Univac-FPO
1517 West Branch Dr.
McLean, VA 22101
703-734-7227

SPERRY UNIVAC
The computer people who listen.

An Equal Opportunity Employer M/F

THIS
SPACE
FOR
HIRE.

[Inquire at Classified
Advertising Dept.]



COMPUTERWORLD

A CHALLENGING CAREER AND THE OUTDOORS TOO

If you want to be challenged in a leading-edge data processing environment, and you like to fish, hunt, golf, hike, run, sail, camp, ski... then we want to talk to you.

We have immediate openings for programmer/analysts. We have a large IBM-compatible computer running MVS, and we are developing CICS and DL/I applications that are sure to challenge your creativity. We use TSO/SPF for program development — one CRT per programmer.

Our under-40,000 community is small enough that you can get from one end of town to the other in 10 minutes, yet large enough to have good schools, comprehensive city planning, and an airport with non-stop one-hour jet service to San Francisco. All the outdoor activities you can imagine are right at your back door — indoor ones, too, including a nationally-renowned Shakespearean and repertory theater. And we offer excellent company benefits, including paid relocation.

We market, direct to the consumer, fruit and foods, roses and other garden products, toys, fine jewelry, outdoor furniture — all relatively stable lines, none dependent on government contracts or awards.

So, if you want a fine career opportunity in data processing AND the best living in the U.S. — and you have at least two years' experience in ALC, and CICS and/or DL/I — send your resume and salary history to:

Mr. Gene Beardsley
Director of Employee Relations
Bear Creek Corporation
2518 So. Pacific Highway
Medford, Oregon 97501

**BEAR CREEK
CORPORATION**

position announcements

position announcements

position announcements

position announcements

position announcements

BANKING SYSTEMS DEVELOPMENT

A.B. Dick Company is hiring EDP management personnel in Spokane, Washington to support an advanced, new INTELLIGENT BANKING TERMINAL SYSTEM.

The banking terminal system utilizes a distributed microprocessor architecture and includes, when fully configured, 176K bytes of read/write and read only storage. The software includes a supervisor, program development tools, and a well rounded library of applications software for savings and loan institutions. A.B. Dick Company will soon introduce this powerful banking terminal to the international marketplace. A new team is being established for this purpose in Spokane, Washington, the site of product development and manufacturing.

Come to the beautiful Pacific Northwest and be a part of this new team if you qualify for one of the following openings:

MANAGER-SOFTWARE ENGINEERING

We seek the candidate with a strong background in software development utilizing assembly-level programming to adapt the software for international usage and to establish the software field support program. Familiarity with INTEL 8080 or Zilog 80 microprocessors as well as an understanding of banking terminal applications are desirable.

MANAGER-TECHNICAL SUPPORT

An outstanding opportunity exists for the broadly experienced field engineering candidate to develop and direct the international field service program. The Technical Support Manager will act as liaison with field personnel in a worldwide network of subsidiaries and distributors to insure proper maintenance of the banking terminal product line. Experience dealing with international requirements is highly desirable.

MANAGER-DOCUMENTATION & TRAINING

Candidates with EDP technical writing and/or classroom training background should apply for this assignment. Responsibilities include development of all product line brochures and systems manuals. Additionally, the incumbent coordinates classroom training and conducts the system introduction classes in Spokane.

The individual selected will carry full responsibility for worldwide support of the new product line. Technical expertise and the capability to adapt to the international marketplace and to work in a team will be stressed heavily as selection criteria.

We are prepared to offer a highly competitive compensation plan commensurate with experience. For confidential consideration, please telephone our worldwide headquarters at: (312) 647-8800, Ext. 2308 or submit a detailed resume with salary history to:

MANAGER, PERSONNEL Corporate Staff & Planning A.B. DICK COMPANY

World Headquarters
5700 West Touhy Avenue
Chicago, IL 60648

Equal Opportunity Employer M/F

ABDICK

AN ACKNOWLEDGED LEADER IN THE AUTOMATED OFFICE SYSTEMS FIELD

PROGRAMMERS ANALYSTS

Blue Cross of Northeast Ohio has immediate openings for qualified data processing programmer/analysts to work on installation of an IMS-based national claims processing package. This 3-plus year project requires a variety of skills from analysts, for current business evaluation and redesign, to skilled technicians to research, enhance and troubleshoot package performance.

Blue Cross of Northeast Ohio possesses one of the largest and most sophisticated data processing centers in the area. Our commitment is to provide the best possible data processing capabilities to our users through a combination of the most current hardware and software applications and individuals who can match this commitment.

We have career opportunities at various levels of the professional range. Background must include: User contact, IMS DB/DC, COBOL, OS and IMS, JCL and utilities. Assembler and GIS are a plus.

Our current environment includes an IBM 370/3033 computer. The list of major software includes OS/MVS and IMS.

For programming aid, we use TSO terminals and a HASP RJE station located in the Systems and Programming area. Continuing professional development of our personnel is an integral portion of our philosophy.

Blue Cross of Northeast Ohio offers a competitive salary and benefits package as well as career growth opportunities.

Please send your resume including your salary requirement to:

Mr. Jay Levine
Personnel Specialist



Blue Cross
of Northeast Ohio

2069 East 9th Street
Cleveland, Ohio 44115
An Equal Opportunity Employer, M/F/H

© Registered North Blue Cross Association



MARKETING REPRESENTATIVES Nationwide Openings

NCR Comten is searching for highly motivated marketing representatives to market our innovative computer data communications products. This unique opportunity is available to skilled sales representatives in search of an aggressively expanding industry leader. (NCR Comten has enjoyed 43% annual growth for 7 years).

Successful candidates should possess a demonstrated record of progressive experience in data processing sales. Knowledge of IBM systems and/or teleprocessing will give a candidate a definite advantage.

The marketing representatives selected will have the opportunity to market computer data communications products to Fortune 500 accounts and coordinate pre/post sales activities.

The high degree of professionalism expected by the organization is rewarded by a generous compensation plan, complete benefits, expenses and a unique opportunity to grow with an industry leader.

For immediate consideration, please contact Donna Rester. Collect calls will be taken at (612) 638-7408. Resumes will be accepted in strict confidence. Please indicate your preference in geographic area(s).

NCR Comten, Inc.

2700 Snelling Ave. N.

St. Paul, Mn. 55113

An Equal Opportunity Employer M/F

DATA PROCESSING

Associated Grocers, Inc., a leading Northwest wholesale distributor has several outstanding computer science positions available.

* PROGRAMMER/ANALYSTS * TECHNICAL WRITER

PROGRAMMER/ANALYSTS - We are seeking top flight programmer/analysts who are interested in excellent growth opportunities utilizing your degree or work experience in a progressive data processing department. You need a minimum of 2 years COBOL experience in an OS environment. Additional experience in CICS command-level/IDMS/MVS would be beneficial. If you have this background we are interested in talking with you about a future with our organization.

TECHNICAL WRITER - We have available an excellent opportunity for an experienced professional technical writer with a data processing background. Responsibilities will include writing and publishing documentation and instruction for use within the department and for users of data processing services. If you are capable of preparing high quality visual materials and have an ability to write clearly and concisely, this may be your opportunity for growth and development.

The above positions are available immediately with excellent salaries and an outstanding benefits program. Please send resume or contact:

Personnel Office
Associated Grocers, Inc.
3301 South Norfolk
Seattle, WA 98124

equal opportunity employer m/f/h

PROJECT MANAGER CORPORATE SYSTEMS DEVELOPMENT

A multi-billion dollar grain marketing and processing firm, located in the twin cities of Minneapolis/St. Paul, is embarking on a multi-project, multi-year program to develop and implement Corporate systems development plan. This plan has received the commitment of top management for all phases of development, including staffing support. In this effort we will be utilizing state-of-the-art technology including database management and telecommunications.

We are actively seeking an individual with significant experience in leading or directing large systems development projects. This person will have a ground floor opportunity to design and develop new project work.

For someone who can draw upon related technical experience, creative problem solving and the ability to work effectively with MIS professionals, users and management, we can offer you challenges, recognition and the reward and growth potential of a large, successful corporation.

In addition to a challenging career opportunity, this position offers excellent salary commensurate with experience and a generous company benefit program.

For prompt confidential consideration please send resume and salary history to: CW Box 2487, 375 Cochituate Rd., Rte. 30, Framingham, Ma. 01701

NCR COMTEN

[For details, call or write
our Circulation
Department]



COMPUTERWORLD

ROCKWELL'S ROCKY FLATS PLANT IN COLORADO has immediate openings for:

COMPUTER SCIENTIST

The Wind Systems Group at Rocky Flats, Rockwell International, is seeking a Computer Scientist with a minimum of four years experience with Data General NOVA and Eclipse Systems. Requires a BS in Math or Computer Science. Will provide systems engineering for the Extended Computerized Data Acquisition System. Will also evaluate and recommend new software and hardware needed to maintain and improve system proficiency and utilization.

SYSTEMS ENGINEER

Requires a BS degree in Computer Science, Data Information Systems or equivalent with a minimum of four years experience in systems programming. Must have knowledge of latest technologies of computer operating systems, programming languages, data base and computer hardware. Responsibilities include reviewing specifications for new or changed computer applications, performing audits and re certifying the protection adequacy of operational computer applications, performing risk analyses for computer applications developing back-up recovery procedures to prevent data loss and to minimize the interruption of computer services.

SYSTEMS ANALYST

Position requires a BS degree in Computer Science, or equivalent with minimum of two years experience in the design and implementation of large Data Processing systems. Individual will serve as a team member to design and implement a new online accountability system. Responsibilities include interfacing with programmers and developing program specifications.

Benefits include:

Paid vacation, group insurance, dental plan, paid holidays, retirement plan, credit union, modern and safe working conditions, and many more.

Submit resumes in confidence to:

Mrs. Janell Romano
Employment Department
Energy Systems Group
ROCKWELL INTERNATIONAL
Rocky Flats Plant
P.O. Box 464
Golden, CO 80401



**Rockwell
International**

...where science gets down to business

Equal Opportunity Employer M/F. U.S. Citizenship Required.

NORTH COAST OPPORTUNITIES MANAGEMENT POSITIONS:

For some of these opportunities management experience is not required.	
MR. DIRECTOR (RPG II)	\$30-35K plus COLE
Manage all systems and DP projects; recession proof environment.	
PROGRAMMING MANAGER (RPG II/Programmer qualities)	\$15-20K
There is an opportunity for programmer with light experience to move into management right away. Local division of Fortune 200 company. System 34 equipment.	
MANAGER NEW DEVELOPMENT (Supervises 5)	\$27-32K
Supervises all new systems design, IBM environment, excellent benefits.	
SYSTEMS & PROGRAMMING MANAGER	\$28-33K
Programmers in COBOL in RPG & COBOL - Hardware upgrade planned.	
DP MANAGER (Light experience qualifies)	\$15-20K
Mini-environment with COBOL, get involved with new hardware are software recommendation.	
PROJECT MANAGER (Programmer qualities)	\$22-26K
Programming is done in Assembler and COBOL, good growth potential.	
PROJECT LEADER (RPG II)	\$18-23K
Work with manufacturing applications (any application qualities). System III Environment.	
SR. PROGRAMMER (more to mgr. of maintenance)	\$30-34K
State of the art environment, local division of Fortune 500 corporation.	
PROJECT MANAGER (Heavy user interface)	\$25-30K
Supervising, managing, project, Non IBM environment.	
DP MANAGER (All new system development)	\$22-30K
Expanding staff, IBM environment, financial applications.	
PROGRAMMING MANAGER (Sr. Analyst qualities)	\$20-23K
Supervises 5-7 programmer analysts, you do not have to be manager now, company has no manager.	
PROGRAMMING MANAGER (Growth position)	\$20-40K
Look for leader in the field, IBM environment.	
PROJECT LEADER (Heavy user interface)	\$15-20K
Some local travel is required. Work with Data Base.	
RETAIL PROJECT MANAGER (Heavy user interface)	\$20-40K
Heavy key project, set up new business systems, report directly to MIS director.	
PROJECT LEADER (5% profit in department)	\$22-28K
Any hardware qualifies, much new systems development, much user interface and education.	
TIME SHARING PROJECT LEADER (International Firm)	\$28-30K
Business System Application using FORTRAN, RAN, some financial modeling, supervise production.	
PROJECT LEADER (Division of Fortune 50)	\$15-23K
Extremely stable company, mostly financial applications.	
PROJECT MANAGER (Trucking)	\$20-30K
Fuel IBM hardware on order, head key project team.	
PROJECT LEADER (Heavy user interface)	\$20-25K
DOS & OS conversion planned, talent most important, not experience, key position.	
PROJECT LEADER (Programming experience qualities)	\$15-20K
Supervise programmers, work with new systems development, newly formed department.	
DP MANAGER (New hardware planned)	\$20-30K
RPG II environment, position leads to corporate MIS director.	
ASSISTANT TO DP MANAGER (PL-1)	\$20-30K
Work as shift supervisor project leader. Fortune 500 company.	



COMPUTER PERSONNEL

1148 Euclid Suite 210
Cleveland, Ohio 44115
or call Louise Falcone
216/781-5344

One of the Midwest's largest EDP Specialists

UNPRECEDENTED CAREER OPPORTUNITIES UNDER CLEAR, BLUE FLORIDA SKIES..

PARADYNE is continuing to secure a role of leadership in the challenging field of Data Communications through remarkable technological advancements. Our unique product line is envied throughout the industry for its high level of technical sophistication and strict adherence to quality assurance. Our goal, through the combined efforts of our professional family, is to produce the most advanced Data Communications Network in the world. To successfully meet this end, we are seeking the following key individuals.

SOFTWARE DESIGNERS (RESPONSE)

Experience with Operating Systems Internals on large scale IBM Systems using Assembly Language.

SOFTWARE DESIGNERS (PIX)

Experience with 16 BIT Mini Computers, I/O Drivers & Networking (SNA/SDLC) using Assembly Language. Any experience on large scale IBM Systems Interfacing would be a plus.

SOFTWARE ENGINEERS (PDS SYSTEM)

Experience with Assembler Language and communications protocols (SDLC/SNA, BSYNCH, etc.) to work developing Z80 Microprocessor software.

SOFTWARE TECHNICAL WRITERS

Currently we have openings for Technical Writers to interface with engineers and programmers to develop user software manuals. We need professionals with a solid background in the computer science/electronics fields with a minimum of two years software writing experience. Knowledge of IBM 360/370, minicomputers and assembler language is a plus.

SYSTEMS ENGINEERS/MARKETING SUPPORT

Systems Programming experience with IBM Operating Systems Internals using Assembly Language and Data Communications (CICS, IMS/DC, ENVIRONI, etc.). Must be able to travel and enjoy working with customers.

PROGRAMMER ANALYSTS

Experience with RPG II in an On Line environment using the IBM System 34 developing business applications. Any experience with the MAPICS manufacturing system would be a plus.

PARADYNE is located in Largo, Florida adjacent to Clearwater/St. Petersburg and minutes away from the Tampa Bay area, offering convenience to all major points of interest. The lifestyle in Largo is a new and affordable one with a well respected school system, safe and attractive residential communities, and NO STATE INCOME TAX. We offer nationally competitive salaries,

aliberal benefits program and a progressive working environment that fosters professional development and career growth. For additional information on a dynamic career with PARADYNE, please hurry your resume, including salary history, to:

paradyne

John Zapp
Director of
Professional Recruitment
PARADYNE
CORPORATION
Dept. 2W-120
1000 Pinellas Park
Largo, Florida 33541
An Equal Opportunity Employer M/F
"Unprecedented Careers with the
Unchallenged Leader"

Find a computer

in

Cleveland,

or a disk drive in

Detroit.

Right here

in

Computerworld's

Classifieds.

Systems Analysts/ All Levels

Lead the way into the
Information Age!

GTE Lenkurt offers you the opportunity to join a world leader in digital and microwave telecommunications. We're at the forefront of the thrust into the Information Age, an era when communications and knowledge spread throughout the world.

We currently have senior level positions available which require experience in the design and development of on-line order entry/order processing systems for a manufacturing company involving both build-to-order and build-to-stock products. A proven track record, strong leadership ability, and good communication skills are also necessary. Knowledge of IMS-DB/DC is desirable.

Opportunities also exist for professionals to participate in developing our new on-line order entry system. Experience in analysis and design of computerized business information systems is essential. Experience in IMS/ADF or EASYTRIEVE/IMS is desirable. You should also have some background in COBOL and JCL as well as knowledge of business functions and strong communication skills.

Become part of a global family, GTE, with benefits including medical/dental/disability/life insurances; tuition reimbursement; employee credit union; and employee store, to name a few.

For immediate consideration, please call or send your resume to Sally O'Bannon, GTE Lenkurt, Incorporated, 1105 County Road, San Carlos, CA 94070. Or call COLLECT (415) 595-3000, ext. 2819. We are an equal opportunity/affirmative action employer.



COMPUTERWORLD



Communications
Transmission Systems
"Helping the World Communicate."

position announcements

position announcements

Office Automation Consultant

AT WANG YOUR FUTURE IS HERE TODAY.

Wang is a world leader in office automation. We're growing faster in information processing than any other company in the industry. All of which could mean faster movement for your career. Also, Wang offers some of the most competitive salaries you can find, plus an environment where your ideas could flourish.

Put yourself at the leading edge of Office Automation with Wang's expanding Office Automation Support Group. As a Consultant, you will design and pilot methods for pre-sales needs analysis and procedural guides for post-sales implementation. These methods and guides will be used to support the successful installation of Wang Office Automation Systems.

If you have at least six years' data processing or telecommunications experience in implementing office automation projects, we would like to talk with you. Excellent written and oral communication skills are essential; familiarity with office automation concepts is preferred.

We offer excellent salary and benefits including profit sharing, stock purchase plan, stock bonus plan, medical and dental insurance. Please send resume including salary history to Erika Putnam, Professional Recruiter, Dept. CW-119, One Industrial Ave, Lowell, MA 01851

Making the world more productive.

© 1980 Wang Laboratories, Inc., Lowell, MA 01851
We are an affirmative action employer.

PROGRAMMER BUILD SUNSHINE INTO YOUR PROGRAM!

On Florida's beautiful Sun Coast, between Sarasota and the dynamic Tampa Bay area, where the delightful climate and recreational opportunities add that "something extra" to your life, in Bradenton, home of First City Federal Savings and Loan.

It could be your home, too. First City is currently seeking a Programmer with NEAT/3 background and preferably NCR "CLASS" or "CIF" experience for our expanding 8555-1 MEG environment (using 270's and 796's).

Progressive and expanding, First City offers an excellent salary and topnotch benefits in a vacationland atmosphere that makes your leisure time yours to enjoy year 'round. To find out more, call Ray Barth,
FIRST CITY SAVINGS & LOAN,
P.O. Box 1989, Bradenton, FL
33508. Phone (813) 748-2351.

An Equal Opportunity Employer M/F



PHOENIX, ARIZONA MIS MANAGEMENT OPENINGS

The City of Phoenix, has immediate openings in the MIS Department, due to a reorganization, for 3 progressive, well qualified managers to head up the following key areas:

ASSISTANT MIS DIRECTOR

Salary \$28,579 — 40,685 annually plus benefits. This executive level position oversees the management of two major MIS Divisions (Applications and Operations). These divisions are responsible for the development, maintenance and operations of all City-Wide Computer Systems. The qualified applicant will have at least 5 years of increasing experience in this management environment. Broad experience should include the management of a minimum EDP Budget in excess of 1 million dollars and the use of large scale current technology. Degree preferred.

APPLICATIONS SERVICES ADMINISTRATOR

Salary \$27,539 — 39,208 annually, plus benefits. This administrative level position manages 50 professionals in the division responsible for the development, support and enhancements to Application Systems. Major development is done in a Level 66 Honeywell environment with multiple applications serving 22 Departments. The qualified Applicant will have a broad range of increasing experience for a minimum of 3 years at a supervisory or Project Leader level. Degree preferred.

TECHNICAL SERVICES ADMINISTRATOR

Salary \$27,539 — 39,208 annually, plus benefits. This administrative level position manages the division responsible for the development and administration of the City's EDP planning and research activities, and installation and utilization of all Technical Software. The qualified applicant will have a broad range of increasing experience encompassing a majority of these areas. Supervisory and Project Leader experience in the development of major application or Technical Systems for a minimum of 3 years required. Degree preferred.

CITY OF PHOENIX

Personnel Department
10 N. Third Ave.
Phoenix, Arizona 85003



An Equal Opportunity Employer M/F

The Energy Builders

Opportunities: Pacific Northwest

Washington Public Power Supply System is a young, growing company engaged in the energy business in the state of Washington. We are located in Richland, an area surrounded by mountains and rolling hills. Plentiful sunshine and uncrowded recreational facilities provide for numerous fishing, hunting, skiing, camping and sailing opportunities.

Programmer/ Analysts

We are looking for application Computer Programmer/Analysts and Systems Analysts with a minimum of three years' experience. Working knowledge of DBMS and interactive systems is desirable.

We invite you to further your career and accept the challenge that Washington Public Power Supply System offers. Call COLLECT to our Data Processing Manager at (509) 372-5483 or send your resume and salary history in confidence to: Ms. Tish Jongewar, Dept. PJJ/42/4a, Washington Public Power Supply System, P.O. Box 968, Richland, WA 99352. An affirmative action employer.

WPPSS

WASHINGTON PUBLIC POWER SYSTEM

position announcements

CLASSIFIED

- POSITION ANNOUNCEMENTS
- BUY SELF SWAP
- SOFTWARE
- TIME & SERVICES
- SOFTWARE FOR SALE
- REAL ESTATE
- BUSINESS OPPORTUNITIES

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or a camera ready mechanical, stat or film negative of your ad just call Sue Stevens at 1-800-343-6474. She will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

**Ad closing is every Friday,
10 days prior to issue date.**

Rates: Open rate is \$84.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs \$169.40 per insertion. Additional space is available in half-inch increments. Some sample sizes and costs are shown.

1 col x 4" — 338.80
2 cols x 4" — 677.60
2 cols x 5" — 847.00
2 cols x 8" — 1355.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available. \$10 per insertion.

Ad Closing is every Friday, 6 working days prior to issue date (issues are dated Monday).

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617) 879-0700
New York - (201) 967-1350
Chicago - (312) 827-4433
San Francisco - (415) 421-7330
Los Angeles - (213) 450-7181

TELECOPIER SERVICE -
(617) 879-0700

William J. Mills,
Manager
Classified Advertising

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

Postage will be paid by

CIRCULATION DEPARTMENT



375 Cochituate Road, Rte. 30
Framingham, MA 01701

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



position announcements

position announcements

position announcements

position announcements

position announcements

DATA PROCESSING PROFESSIONALS AT HOME FEDERAL WE'RE BANKING ON YOU!

San Diego
If you are a Computer Professional seeking an opportunity to work with the latest in hardware and software packages; plus designing new systems for Home Federal - in a challenging and exciting environment - where your ideas and accomplishments are appreciated and rewarded - then search no further.

HOME FEDERAL is the nation's largest Savings & Loan consumer lender, committed to excellence in financial and professional opportunities. We are an influential and innovative \$4 billion institution known for its progressive Data Processing Department and banking policies.

Our offer includes the opportunity to work in a state-of-the-art, IBM shop, designed to keep you and Home Federal at the forefront of computer technology. We currently have career opportunities available for:

SYSTEMS ANALYST

Requires experience in the consumer installment, lending areas, both direct and indirect. Requires demonstrated skills in system design using structure methodology and on-line systems design. Minimum 2 yrs. analysis and 3 yrs programming experience.

PROGRAMMER ANALYST

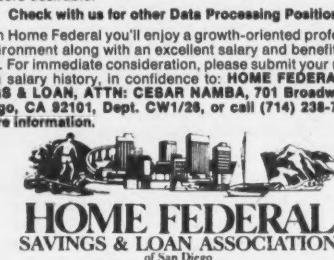
2-7 yrs. experience in COBOL application programming. The successful candidates will provide the lead support to projects such as ATM network and PEP and PTT Bill Payment. Will develop, test and debug new and existing HF data processing systems.

SOFTWARE SPECIALISTS

Will be involved in systems programming using on-line assembly for mini-computers in large network. Responsibilities will be both systems and application programming. Experience working with General Automation minis preferred, but not required.

SOFTWARE SPECIALIST

IBM software communication systems support. Will generate, implement and maintain IBM communication software (local & remote). Requires knowledge of VTAM, NCP, ACF and CICS interfaces. Detail knowledge of data communications concepts and facilities (SNA environment). Knowledge of remote processors desirable.



**HOME FEDERAL
SAVINGS & LOAN ASSOCIATION
of San Diego**

An Equal Opportunity Employer M/F/H

Imagine Yourself Living in SUNNY FLORIDA

The high quality life style of the beautiful Tampa Bay Area is available now for individuals with 2 or more years of experience in any of the following:

IMS-DB/DC Data Base Administration.
Logical/Physical design; Gen's; Recovery/
Reorg.; UCC-10 Data Dictionary; Application
Consulting.
IMS-DB/DC Systems Programming.
BAL; Custom Exits; MFS Modification;
Performance tuning.

We also have senior and supervisory positions in Corporate Data Resource Management planning and large scale Data Base Integration planning.

Opportunities are also available for programmers and systems analysts with experience in the following:

Large IBM Systems —
Cobol, TSO, CICS, IMS, Assembler

Contact:

Karen D. Kaul (RM)
Employment Representative
GTE Data Services
P. O. Box 1548
Tampa, Florida 33601



GTE Data Services Incorporated

"Equal Opportunity Employer M/F"

CLASSIFIED

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE
- TIME & SERVICES
- SOFTWARE FOR SALE
- REAL ESTATE
- BUSINESS OPPORTUNITIES

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or a camera ready mechanical, stat or film negative of your ad just call Sue Stevens at 1-800-343-6474. She will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

**Ad closing is every Friday,
10 days prior to issue date.**

Rates: Open rate is \$84.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs \$169.40 per insertion. Additional space is available in half-inch increments. Some sample sizes and costs are shown.

1 col x 4" — 338.80
2 cols x 4" — 677.60
2 cols x 5" — 847.00
2 cols x 8" — 1355.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available. \$10 per insertion.

Ad Closing is every Friday, 6 working days prior to issue date (issues are dated Monday).

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617) 879-0700
New York - (201) 967-1350
Chicago - (312) 827-4433
San Francisco - (415) 421-7330
Los Angeles - (213) 450-7181

TELECOPIER SERVICE -
(617) 879-0700

**William J. Mills,
Manager
Classified Advertising**

ENGINEERS ANALYSTS AND PROGRAMMERS

LOCKHEED Engineering & Management Services Company is seeking qualified applicants for immediate positions at NASA's JOHNSON SPACE CENTER in Houston, Texas. These positions are in support of the Space Shuttle and Earth Resources Programs and require applicants (U.S. Citizenship or permanent residency) experienced in the following areas:

■ INERTIAL GUIDANCE AND NAVIGATIONAL SPECIALISTS

Requires individuals with a BA/MS in engineering/physics and experience in testing and evaluation of inertial guidance and navigation systems. Responsibilities will include testing and evaluation of inertial guidance gyros, accelerometers, inertial measurement units and the associated software used and space flight guidance navigation.

■ DATA BASE ADMINISTRATORS/PROGRAMMERS

Requires individuals with IBM/IMS experience or similar structured systems. Prefer applicants with a BS/BA Degree and two or more years of directly related experience.

■ SPACECRAFT SYSTEMS ENGINEERS

Will be responsible for analysis of spacecraft systems for susceptibility to damage from collisions with objects of hypervelocity and evaluating effects of loss of subsystems on satellite performance.

■ REMOTE SENSING DATA ANALYSTS

With experience using digital data, imagery products, statistical methods and computer systems. Experience in agricultural, hydrological and forestry applications desirable.

■ STATISTICIANS/MATHEMATICIANS

Graduate degree (MS, PhD), specializing in sampling, experimental design, or discriminate analysis, clustering or multivariate techniques.

■ ELECTRONIC DESIGN ENGINEERS

To develop analog/digital television systems. Prefer applicants with a BSEE or with recent electronic design experience.

■ SCIENTIFIC PROGRAMMERS

Applicants should have a BS/BA Degree in the thorough knowledge of ASSEMBLY FORTRAN Programming Analysis.

■ POWER SYSTEMS ENGINEERS

With experience on spacecraft/aircraft electrical power distribution and control/systems including power conversion systems.

■ CARTOGRAPHIC/PHOTOGRAMMETRIC SPECIALIST

Requires extensive experience in the architecture, design and implementation of digital image processing systems with emphasis on geometric properties of optically scanned geographic imagery including the development of mathematical models of digital mapping techniques. Prefer applicants with a MS Degree and 8 years experience.

Send resume in confidence to William R. Jancha at Lockheed Engineering & Management Services Company, Dept. C-20, 1830 NASA ROAD #1, Houston, Texas 77058.

**LOCKHEED
ENGINEERING & MANAGEMENT
SERVICES COMPANY**

An Equal Opportunity Employer M/F/H

ADVANCEMENT OPPORTUNITIES

**ALL INDUSTRIES - ALL LEVELS - Salaries \$20-45,000
NATIONWIDE-FEE PAID-CONFIDENTIAL**

Senior Systems Analysts
Programmer Analysts
Application Programmers
Systems Programmers
EDP Auditors
Hardware/Software Analysts
Mini/Micro Specialists

Project Mgrs./Leaders
Data Base Administrators
Mgrs. Systems/Programming
Mgrs. ED/P Auditing
Mgrs. Data Processing Support
Mgrs. Data Processing/MIS
Mgrs. IBM System 3/34/38

For more details, send your resume, or call:

Mark Fuller

CADILLAC ASSOCIATES, INC.
32 W. Randolph St., Chicago, IL 60601

(312) 346-9400

COMPUTER MANAGER

Located in beautiful western N. Carolina at the national Climatic Center in Asheville! Advanced degree in Computer Science or Environmental Science is highly desired. Position is under federal civil service at the GS-14 level, starting salary \$37,671 (Merit Pay). Must have experience in managing large scale computer system and also in systems analysis and design.

Position requires the coordination, implementation, and management of data processing support in Asheville for data centers located in Boulder, CO, Asheville, N.C., and Washington, D.C.

For additional information and details on application call Grady McKay, (704) 258-2850, ext. 238, or, FTS 672-0238 or write Personnel Officer, National Climatic Center, Federal Building, Asheville, N.C. 28801

Applications must be submitted by Feb. 20, 1981

EQUAL OPPORTUNITY EMPLOYER

position announcements

position announcements

position announcements

position announcements

position announcements



Aquidneck Data Corporation: Because the Possibilities are Endless

Lofty ambitions with skills to match? A move to the Aquidneck Data Corporation will be just the first move. As a small, fast-growing company we offer lots of room to move up. And a friendly, open atmosphere in which to do it. Every position at ADC integrates the training and employee development necessary for realizing the next level right into your current position. The move to our Newport, Rhode Island location is a move up, too: affordable housing surrounded by seacoast in one of New England's most fascinating resort towns. Put your position in a better position...at ADC.

CURRENT OPENINGS

Programmers—Programmers with two or more years of experience to staff a team to design, develop, and integrate software for a new weapon system, and a new simulation system to exercise this and other weapon control software. These positions offer the opportunity to be involved from the beginning in a dynamic project. Experience in UVK-20 programming is desirable.

Engineers—To provide technical consulting to a military computer system V&V program. Technical areas of emphasis will include system and software design verification for a weapon with embedded microcomputers, simulation and test definition and analysis, logical network analysis, and hardware/software interface studies. Experience in testing military systems with embedded computers, or microcomputer systems design is desired.

Systems Analysts—For positions that range from entry level through programmer team leaders and project leaders. Required skills include computer program design, coding, checkout, documentation, and system integration. Experience is desired in assembly language programming, AN/UVK-7 and shipboard systems applications experience is especially valuable.

For more information, please call our Personnel Director, Ellen Rynasiewicz (Rhode Island 847-7260, Out-of-State 1-800-556-7570) or send your resume to P.O. Box 639, Newport, Rhode Island 02840.

Box 639, Newport, RI 02840 1-800-556-7570

An Equal Opportunity Employer M/F

PROGRAMMER ANALYST OPPORTUNITIES

Datapoint Corporation, the pioneer leader in dispersed data processing has career openings for programmer analysts in our SAN ANTONIO office.

JOIN THE "OUT-THINK" TEAM WHERE NO ONE IS A CODER!

While we prefer a degree, your demonstrated skills are what will make the difference. Those professionals with financial and marketing applications experience will have the inside track.

IMAGINATIVE PROFESSIONALS MOVE FAST WITH DATAPPOINT

We can offer you an excellent salary, great company paid benefits, and the advancement potential that makes Datapoint the place where you can move fast. For prompt consideration, please send your resume including salary history to:

Jim Ramsey
Datapoint Corporation
9725 Datapoint Dr., MS M-84
San Antonio, Texas 78284

We are an equal opportunity employer M/F.



Senior Procurement Contract Administrator

Perkin-Elmer's Computer Operations seeks a legally knowledgeable Senior Contract Procurement Administrator capable of seeing a sub contractual agreement through from inception to completion.

This position involves full responsibility for:

- Negotiations
- Legal liabilities
- Business risk
- Contract placement & revisions
- Vendor performance
- Approval authority
- Advising all levels of management

Successful candidate must possess:

- 3-5 years commercially-oriented administrative experience
- Initiative and independent judgement
- The capability to prioritize
- Good working knowledge of software and hardware services
- A business related Bachelor's Degree as a plus

Break out now and start moving with Perkin-Elmer. As a high technology Fortune 500 leader, we offer an excellent salary outstanding fringe benefits that include dental assistance, and all advantages of a beautiful Jersey Shore lifestyle. Please send your resume to: J. Leotta, Perkin-Elmer, Computer Operations, 2 Crescent Place, Oceanport, New Jersey 07757.

PERKIN-ELMER

An Equal Opportunity Employer M/F

Software Opportunities

At Racal-Milgo, we are the world's leading independent supplier of data communications equipment and we're still GROWING.

Due to continued systems development and expanding markets we have several openings for technical specialists in communications and network software. The ideal candidate will have experience with the PDP-11 and the RSX-11M and RT-11 operating systems. Real-time Assembly language programming is required. The incumbent will be responsible for testing and documentation of software as well as on-site customer interface.

Racal-Milgo offers excellent salaries, complete company benefits including 100% paid tuition, liberal relocation policy, life/medical/dental insurance and a stimulating work environment.

Please send your resume to: Tom Person or call (305) 591-5904 (collect) for details and an application.

Racal-Milgo™

Racal-Milgo, Inc.
8600 N.W. 41st Street Miami, Florida 33166
Telephone (305) 592-8600

RACAL
The Electronics Group

If you're not the first to read this issue,
you may be the last to know.

To subscribe, you can use your American Express, Visa or Mastercharge card
and call toll free, 800-343-6474 (in Massachusetts, call 617-879-0700).



F-O-R-T-U-N-E

A National Network Specializing in
Executive and Middle Management Placement.

We are F-O-R-T-U-N-E. For 23 years we have been advancing the careers of thousands of DP Professionals. We are plugged into hundreds of installations on a nationwide basis. If you are SERIOUS about career development and you want and demand CHALLENGES with projects that are SIGNIFICANT and one you can IDENTIFY with then you must avail yourself of these outstanding opportunities.

No One Knows This Market Like We Do
Right Now We Have Over 2500 Jobs In The Following Areas

IHS TEAM LEADER	CICS PRJ. LEADER
IHS TRAINER	CICS (EXTREMELY VISIBLE)
IHS INTERNALS	CICS (LEARN DB/DC)
MVS PERFORMANCE	PRG/ANAL (TRAIN CICS)
SOFTWARE CONSULTANT	PRG/ANAL (TRAIN IMS)
INTERNAL (LEARN MVS)	SYN/ANAL (NO CODING)

PROJECT LEADER (HP-3000)	SCIENTIFIC PROG (FORTRAN)
S/W SUPPORT (MINI/MICRO)	PROGRAMMER (SUPERSTAR)
BUS. SYS (STAFF OF 5)	PROGRAMMER (ASSEMBLER)

F-O-R-T-U-N-E offices servicing the sunbelt area:	360 S. Monroe St. Denver, CO 80209
	Suite 204C (512) 222-7230
	12860 Hillcrest Rd. Dallas, TX 75230
	Suite 100 (214) 681-0288
	1051 N.W. Freeway Houston, TX 77092
	Suite 107C (713) 680-9132

Send your resume or call your nearest office collect.

buy sell swap

BUY SELL SWAP

BUY • SELL • LEASE

**370/115
370/125
370/135
370/138**

Call Donna Sage

**370/145
370/148**

Call Nelson Johnson

**S/3
MODEL 8
MODEL 10
MODEL 12
MODEL 15**

**3742
S/32
S/34**

Call Gayle Drotar
Roger Odom
Jack Goodman

IBM Maintenance Guaranteed

**TAPE
3411 • 3410
3420
DISK**

**3340 • 3344
3350**

Call Bob Ford
or Nelson JohnsonWant our capabilities
brochure? Send us
your business card.

ECONOCOM
1755 Lynnfield Road
P.O. Box 17825
Memphis, Tennessee 38117
901-767-9130
Member CDA

NCR USERS

We deal exclusively in NCR Computer Equipment. If you're buying or selling deal with the nation's oldest and largest. Contact Gary E. Zywotko.

(612) 884-0758

Computer
Connection Corp.
8120 Penn Ave. South
Minneapolis, MN 55431

The HARDWAREHOUSE has your numbers.



**CALL US TODAY AT (602) 248-6848, PHOENIX, ARIZONA
OR CALL OUR LOCAL OFFICE IN YOUR AREA**

Boston: Eastern Regional Headquarters

Washington, D.C.	(617) 272-8110
New York	(703) 521-0300
Philadelphia	(212) 832-2622

(215) 293-0546

San Francisco:**Western Regional Headquarters**

Los Angeles	(415) 283-8980
Denver	(213) 670-7994
Seattle	(303) 534-7436
Portland	(206) 447-1682

(503) 228-7033

Chicago: Central Regional Headquarters

(312) 298-3910

Pittsburgh	(412) 922-8920
Detroit	(313) 961-1675
Minneapolis	(612) 370-1153
St. Louis	(314) 353-8285

Austin: Southern Regional Headquarters

(512) 451-0121

Atlanta	(404) 768-6535
Dallas	(214) 233-1818
Houston	(713) 447-0325

Canada: Toronto

(416) 366-1513

Montreal (514) 281-1925

**GREYHOUND COMPUTER CORPORATION**

SUBSIDIARY OF THE GREYHOUND CORPORATION

TO: BUY, SELL, OR LEASE
DISK I T E L TAPE
CALL OR WRITE
COMPUTER SYSTEMS/GRAFICS
2017 W. 104th
Leawood, KS 66206
TOM LYNN 913+649-2190

3270'sAVAILABLE
FOR
SALE OR LEASE3271/3272 CONTROLLERS
3277 DISPLAY STATIONS
3264/3266/3268 PRINTERS3274 CONTROLLERS
3277 DISPLAY STATIONS
3267/3268 PRINTERS

NF COMPUTER
SALES & LEASING CORP.
1211 W. 22nd St., Suite 424, Oak Brook, IL 60521
Telephone 312-920-8181, Telex 206106 NFC OAKR

buy sell swap

Series/1**S/32****S/34****S/3****S/38**

BUY • SELL • LEASE



COMPUTER OPTIONS, INC.

The Best Option
in IBM Computers

Parkdale Plaza Bldg. #540W
1660 So. Highway 100
St. Louis Park, MN 55416
612 • 540 • 8660
800 • 328 • 5718

DEC VAX**Systems Memories
Peripherals****Immediate Short Term
Deliveries**

call

BROOKVALE ASSOCIATES

800/645-1167 518/567-7777

- SELL •
- 3330 3410
- 3340 3411
- 3350 3420

COMPUTER BROKERS, INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE
901-372-2622



• BUY •

BUY - SELL - LEASE - BROKERAGE

Let the:

"NATION'S LARGEST WHOLESALE DEALER"

Buy, sell, lease, sub-lease, or be your agent in placement of your pre-owned IBM 360/370/System 3, or other units.

COMPUTER INTERNATIONAL, LTD.

CWC's International division

experts in foreign markets, freight, customs

BEACH COMPUTER CORPORATION, CWC's Leasing Division

COMPUTER WHOLESALE CORP., (504) 581-7741

SUITE 507/508 FIRST NATIONAL BANK OF COMMERCE BLDG.

NEW ORLEANS, LOUISIANA 70112

MEMBER OF COMPUTER DEALERS ASSOCIATION

COMDISCO**Your First Choice ✓
In The Second Market****IBM PROCESSORS**

- 3033 Will Buy/Lease/Finance
- 3032 Systems Available 1st Qtr.
- 3031 24-36 Month Leases
- 3168 Systems Available Now
- 3165 Good Price Performance
- 3158 All sizes — Short Term
- 3155 One Year Leases
- 4341 Systems Available 1st Qtr.
- 3148 12-24 Month Leases
- 3145 Month-to-Month
- 3138 Month-to-Month
- 3135 Month-to-Month

IBM PERIPHERALS

- 3880 Immediate Availability
- 3370 For Sale/Lease
- 3350 Immediate Availability
- 3420 All Models Available
- 3330 15-Day Delivery
- 3340/44 For Sale/Lease

We Can Put It Together

Branch Offices:
 Atlanta 404-256-5956
 Chicago 312-698-3000
 Connecticut 203-853-8966
 Dallas 214-258-6444
 Ft. Worth 817-534-1774
 Michigan 313-644-1500
 New Jersey 201-568-9666
 San Francisco 415-944-1111
 Washington D.C. 301-441-1000
 Latin America 305-266-5882
 Toronto 416-498-7220
 Paris 297-2000
 Switzerland 021-71-09-35
 West Germany (2434) 3948
 Toll Free Number 800-323-2144

Corporate Headquarters
 Comdisco, Inc.
 6400 Shafer Court 312-698-3000
 Rosemont, IL 60018 TWX — 910-253-1233

MEMBER CDA/CLA

**3370
Disk Drives**Immediate
Delivery

call

Bob Bardagy

312-698-3000

Or Your Local Office

COMDISCO**SYSTEM 3 — D25****COMPLETE SYSTEM
1 or 2 Yr. Lease or Sale
IMMEDIATE DELIVERY**

For Sale or Lease

4341-K 4341-L

Jan. '81 Ship Apr. '81 Ship

3880-1 Jan. '81 Ship**3270 Terminals****Printers & Controllers****Available Immediately**

Call: Steve Dexler or Judie Port

Princeton Computer**Associates Inc.**

205 LIVINGSTON AVENUE

NEW BRUNSWICK, N.J. 08901

(201) 846-2200

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

★★★★★★★★★★★★

buy sell swap				
---------------	---------------	---------------	---------------	---------------

**O.P.M.
LEASING
SERVICES,
INC.**

**The Custom
Leasing People**

Branch Offices

ATLANTA	(404) 953-0926
BOSTON	(617) 749-4844
CHICAGO	(312) 945-8150
DALLAS	(214) 641-7870
DENVER	(303) 499-4488
DETROIT	(313) 996-5811
HOUSTON	(713) 367-1668
KANSAS CITY	(816) 474-8106
LOS ANGELES	(213) 278-4117
MINNEAPOLIS	(612) 884-9980
NEW JERSEY	(201) 635-1092
N.Y. FINANCIAL DISTRICT	(212) 747-0220
ST. LOUIS	(314) 434-6330
SAN FRANCISCO	(415) 383-4111
WASHINGTON, D.C.	(202) 656-8676

International Offices

LONDON	01-222-4031
PARIS	331-775-0511
COLOGNE, GERMANY	221-763-1458



Corporate Headquarters

O.P.M. LEASING SERVICES, INC.
71 BROADWAY, NEW YORK, N.Y. 10006
(212) 747-0220
TWX: 710-581-5223 OPM LEASE/NYK

**Short or Long Term
Leases From
RANDOLPH**

**4300's
303X**

**...and all 370 CPU's
and peripherals**

800-243-5307



Randolph Computer Company
Division of The Bank of Boston
537 Steamboat Rd., Greenwich, Ct 06830
(203) 661-4200



Short and Long Term Lease Plans Available

CPUs

370/135
370/145
370/155
370/165

All Configurations Available For Sale or Lease

303X Series

Purchase/Leaseback of Installed or OPM Supplied

370/158
370/168

All Configurations Available For Sale or Lease

4300 Series

All Configurations Available for Sale or Lease
Subject to adherence to IBM's order certification process

370/138
370/148

All Configurations Available For Sale or Lease

Amdahl All Models
CDC Cyber 74
Univac 1100 Series

All Configurations Available For Sale or Lease

FEATURES/MEMORY

370/158 & 168
ISC/Madrids
All Channels
For Sale or Lease

IBM Memory:
370/158s, 168s, etc.
or 3000 Series
Machines
For Sale or Lease

OEM Memory:
155s, 158s, 168s,
either EM&M, NSC,
Intel or STC
For Sale or Lease

PERIPHERALS

3333/3330s
3350s
3830s
All Configurations Available For Sale or Lease

3803 Controllers
3420 Tapes
All Models and Configurations Available For Sale or Lease

3211/3811
1403/2821
All Configurations Available For Sale or Lease

Complete Installation and Planning Support Provided

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guarantee. Full Reels. All External Labels Removed. Guaranteed for use at 1600 BPI through 6250 BPI.

2400' Reel \$4.95 ea.
1200' Reel \$4.25 ea.
600' Reel \$3.50 ea.

All Tapes with Hanging Seals
We pay freight on orders over 200 tapes

All orders shipped within 48 hours

Call or Write

Computer Tape Mart
169 B New Highway
Amityville, New York 11701
[516] 842-8512

DEC NOW

Vax Systems CALL
11/70 W or Datastar Systems NOW
11/04 RL01 System \$19,000
11/3A systems NOW
11/70 W/RP08's or RM03's New and Used
Peripherals, disc tape, and boards. CALL
VTP100 \$1700.00

WANTED FOR CASH

any and all DEC systems and peripherals.
All inquiries immediately answered.

DATWARE
SYSTEMS LEASE, INC.

30 Bay St.
State/Post Office, 10001
(212) 447-4911
Telex 425864
TWX 710-588-8738

DATA GENERAL - DEC SURPLUS SPECIALS

DATA GENERAL		DEC
NOVA 40K NOVA 3D NOVA 1200 NOVA 2110 ECLIPSE S/230 ECLIPSE C/230	CPU'S	PDP 8 11/03 11/04 11/05 11/06 11/08 11/09 11/10 11/11 11/12 11/13 11/14 11/15 11/16 11/17 11/18 11/19 11/20 11/21 11/22 11/23 11/24 11/25 11/26 11/27 11/28 11/29 11/30 11/31 11/32 11/33 11/34 11/35 11/36 11/37 11/38 11/39 11/40 11/41 11/42 11/43 11/44 11/45 11/46 11/47 11/48 11/49 11/50 11/51 11/52 11/53 11/54 11/55 11/56 11/57 11/58 11/59 11/60 11/61 11/62 11/63 11/64 11/65 11/66 11/67 11/68 11/69 11/70 11/71 11/72 11/73 11/74 11/75 11/76 11/77 11/78 11/79 11/80 11/81 11/82 11/83 11/84 11/85 11/86 11/87 11/88 11/89 11/90 11/91 11/92 11/93 11/94 11/95 11/96 11/97 11/98 11/99 11/100 11/101 11/102 11/103 11/104 11/105 11/106 11/107 11/108 11/109 11/110 11/111 11/112 11/113 11/114 11/115 11/116 11/117 11/118 11/119 11/120 11/121 11/122 11/123 11/124 11/125 11/126 11/127 11/128 11/129 11/130 11/131 11/132 11/133 11/134 11/135 11/136 11/137 11/138 11/139 11/140 11/141 11/142 11/143 11/144 11/145 11/146 11/147 11/148 11/149 11/150 11/151 11/152 11/153 11/154 11/155 11/156 11/157 11/158 11/159 11/160 11/161 11/162 11/163 11/164 11/165 11/166 11/167 11/168 11/169 11/170 11/171 11/172 11/173 11/174 11/175 11/176 11/177 11/178 11/179 11/180 11/181 11/182 11/183 11/184 11/185 11/186 11/187 11/188 11/189 11/190 11/191 11/192 11/193 11/194 11/195 11/196 11/197 11/198 11/199 11/200 11/201 11/202 11/203 11/204 11/205 11/206 11/207 11/208 11/209 11/210 11/211 11/212 11/213 11/214 11/215 11/216 11/217 11/218 11/219 11/220 11/221 11/222 11/223 11/224 11/225 11/226 11/227 11/228 11/229 11/230 11/231 11/232 11/233 11/234 11/235 11/236 11/237 11/238 11/239 11/240 11/241 11/242 11/243 11/244 11/245 11/246 11/247 11/248 11/249 11/250 11/251 11/252 11/253 11/254 11/255 11/256 11/257 11/258 11/259 11/260 11/261 11/262 11/263 11/264 11/265 11/266 11/267 11/268 11/269 11/270 11/271 11/272 11/273 11/274 11/275 11/276 11/277 11/278 11/279 11/280 11/281 11/282 11/283 11/284 11/285 11/286 11/287 11/288 11/289 11/290 11/291 11/292 11/293 11/294 11/295 11/296 11/297 11/298 11/299 11/300 11/301 11/302 11/303 11/304 11/305 11/306 11/307 11/308 11/309 11/310 11/311 11/312 11/313 11/314 11/315 11/316 11/317 11/318 11/319 11/320 11/321 11/322 11/323 11/324 11/325 11/326 11/327 11/328 11/329 11/330 11/331 11/332 11/333 11/334 11/335 11/336 11/337 11/338 11/339 11/340 11/341 11/342 11/343 11/344 11/345 11/346 11/347 11/348 11/349 11/350 11/351 11/352 11/353 11/354 11/355 11/356 11/357 11/358 11/359 11/360 11/361 11/362 11/363 11/364 11/365 11/366 11/367 11/368 11/369 11/370 11/371 11/372 11/373 11/374 11/375 11/376 11/377 11/378 11/379 11/380 11/381 11/382 11/383 11/384 11/385 11/386 11/387 11/388 11/389 11/390 11/391 11/392 11/393 11/394 11/395 11/396 11/397 11/398 11/399 11/400 11/401 11/402 11/403 11/404 11/405 11/406 11/407 11/408 11/409 11/410 11/411 11/412 11/413 11/414 11/415 11/416 11/417 11/418 11/419 11/420 11/421 11/422 11/423 11/424 11/425 11/426 11/427 11/428 11/429 11/430 11/431 11/432 11/433 11/434 11/435 11/436 11/437 11/438 11/439 11/440 11/441 11/442 11/443 11/444 11/445 11/446 11/447 11/448 11/449 11/450 11/451 11/452 11/453 11/454 11/455 11/456 11/457 11/458 11/459 11/460 11/461 11/462 11/463 11/464 11/465 11/466 11/467 11/468 11/469 11/470 11/471 11/472 11/473 11/474 11/475 11/476 11/477 11/478 11/479 11/480 11/481 11/482 11/483 11/484 11/485 11/486 11/487 11/488 11/489 11/490 11/491 11/492 11/493 11/494 11/495 11/496 11/497 11/498 11/499 11/500 11/501 11/502 11/503 11/504 11/505 11/506 11/507 11/508 11/509 11/510 11/511 11/512 11/513 11/514 11/515 11/516 11/517 11/518 11/519 11/520 11/521 11/522 11/523 11/524 11/525 11/526 11/527 11/528 11/529 11/530 11/531 11/532 11/533 11/534 11/535 11/536 11/537 11/538 11/539 11/540 11/541 11/542 11/543 11/544 11/545 11/546 11/547 11/548 11/549 11/550 11/551 11/552 11/553 11/554 11/555 11/556 11/557 11/558 11/559 11/560 11/561 11/562 11/563 11/564 11/565 11/566 11/567 11/568 11/569 11/570 11/571 11/572 11/573 11/574 11/575 11/576 11/577 11/578 11/579 11/580 11/581 11/582 11/583 11/584 11/585 11/586 11/587 11/588 11/589 11/590 11/591 11/592 11/593 11/594 11/595 11/596 11/597 11/598 11/599 11/600 11/601 11/602 11/603 11/604 11/605 11/606 11/607 11/608 11/609 11/610 11/611 11/612 11/613 11/614 11/615 11/616 11/617 11/618 11/619 11/620 11/621 11/622 11/623 11/624 11/625 11/626 11/627 11/628 11/629 11/630 11/631 11/632 11/633 11/634 11/635 11/636 11/637 11/638 11/639 11/640 11/641 11/642 11/643 11/644 11/645 11/646 11/647 11/648 11/649 11/650 11/651 11/652 11/653 11/654 11/655 11/656 11/657 11/658 11/659 11/660 11/661 11/662 11/663 11/664 11/665 11/666 11/667 11/668 11/669 11/670 11/671 11/672 11/673 11/674 11/675 11/676 11/677 11/678 11/679 11/680 11/681 11/682 11/683 11/684 11/685 11/686 11/687 11/688 11/689 11/690 11/691 11/692 11/693 11/694 11/695 11/696 11/697 11/698 11/699 11/700 11/701 11/702 11/703 11/704 11/705 11/706 11/707 11/708 11/709 11/710 11/711 11/712 11/713 11/714 11/715 11/716 11/717 11/718 11/719 11/720 11/721 11/722 11/723 11/724 11/725 11/726 11/727 11/728 11/729 11/730 11/731 11/732 11/733 11/734 11/735 11/736 11/737 11/738 11/739 11/740 11/741 11/742 11/743 11/744 11/745 11/746 11/747 11/748 11/749 11/750 11/751 11/752 11/753 11/754 11/755 11/756 11/757 11/758 11/759 11/760 11/761 11/762 11/763 11/764 11/765 11/766 11/767 11/768 11/769 11/770 11/771 11/772 11/773 11/774 11/775 11/776 11/777 11/778 11/779 11/780 11/781 11/782 11/783 11/784 11/785 11/786 11/787 11/788 11/789 11/790 11/791 11/792 11/793 11/794 11/795 11/796 11/797 11/798 11/799 11/800 11/801 11/802 11/803 11/804 11/805 11/806 11/807 11/808 11/809 11/810 11/811 11/812 11/813 11/814 11/815 11/816 11/817 11/818 11/819 11/820 11/821 11/822 11/823 11/824 11/825 11/826 11/827 11/828 11/829 11/830 11/831 11/832 11/833 11/834 11/835 11/836 11/837 11/838 11/839 11/840 11/841 11/842 11/843 11/844 11/845 11/846 11/847 11/848 11/849 11/850 11/851 11/852 11/853 11/854 11/855 11/856 11/857 11/858 11/859 11/860 11/861 11/862 11/863 11/864 11/865 11/866 11/867 11/868 11/869 11/870 11/871 11/872 11/873 11/874 11/875 11/876 11/877 11/878 11/879 11/880 11/881 11/882 11/883 11/884 11/885 11/886 11/887 11/888 11/889 11/890 11/891 11/892 11/893 11/894 11/895 11/896 11/897 11/898 11/899 11/900 11/901 11/902 11/903 11/904 11/905 11/906 11/907 11/908 11/909 11/910 11/911 11/912 11/913 11/914 11/915 11/916 11/917 11/918 11/919 11/920 11/921 11/922 11/923 11/924 11/925 11/926 11/927 11/928 11/929 11/930 11/931 11/932 11/933 11/934 11/935 11/936 11/937 11/938 11/939 11/940 11/941 11/942 11/943 11/944 11/945 11/946 11/947 11/948 11/949 11/950 11/951 11/952 11/953 11/954 11/955 11/956 11/957 11/958 11/959 11/960 11/961 11/962 11/963 11/964 11/965 11/966 11/967 11/968 11/969 11/970 11/971 11/972 11/973 11/974 11/975 11/976 11/977 11/978 11/979 11/980 11/981 11/982 11/983 11/984 11/985 11/986 11/987 11/988 11/989 11/990 11/991 11/992 11/993 11/994 11/995 11/996 11/997 11/998 11/999<br

buy sell swap

XDS/SDS**BUY-SELL-REPAIR**

- *COMPUTERS
- *PERIPHERALS
- *SPARES
- *RADs
- *POWER SUPPLIES
- *DRUMS
- *MEMORIES

FOR INFORMATION
AND BROCHURE CALL
800-423-5321
(IN CALIF.)
213-889-6031



Equipment Support Division

URGENTLY NEEDED! ANY QUANTITY!

DEC and
DATA GENERAL
computer equipment

CASH AVAILABLE

CALL TODAY!



NEWMAN COMPUTER EXCHANGE
3250 North Main Street Department CW 78
P.O. Box 8610 Ann Arbor Michigan 48107

SYSTEM 3-32-34-38**SERIES 1-5110**

WANT TO BUY ANY SYSTEM 34

Available: S34-E35-E34-C23-C24-D35
5251-11, 5251-12, 5256-03

Communication: 3271, 3272, 3277, 3284
3284, 3286, 3288, 3776
3777, 3780, 3704, 3705

Peripherals: 3741, 3742, 129, 029, 059
3715, 3717, 083, 514, 548
3410, 3411, 3340, 3344

GENE NICHOLL TOM KLEEFISCH



AMERITEX COMPUTER CORP.
14229 Proton Road
Dallas, Texas 75234
214/934-9151

We Want To Sell You
Your Next DEC Terminal!

VT 100-AA . . . \$1,375 EA.*
LA 120-AA . . . \$1,995 EA.*

Items are in stock - no limit

*Quantity 1 cash prices

Call: Sonja at 614-889-0810

SCHERER'S MINI COMPUTER MART
6680 Sunbury Road Westerville, OH 43081

dataserv

Your Authority in the IBM Second Market

Call Dataserv when you need to know Second Market equipment values, market conditions or answers to other questions. People who know Dataserv trust Dataserv. We help you get maximum satisfaction with Second Market transactions. If the equipment you want to buy, sell or lease isn't listed, call our toll free number.

GSD SYSTEMS

SYS 3	SYS 32	SYS 34	SYS 38
All models Short Term Lease Avail	All models Sale or Lease	All models New or Used	Over 100 Off-Pax Avail

DPD SYSTEMS

125	138	4331	3031
135	148	4341	3032
145	158	4341	3033
155	168	4341	3033

PERIPHERALS

3330	3410	3203	1403
3340	3411	3505	1442
3350	3420	3525	2501

All peripherals available on short or long term lease.

1255	1419	3880
------	------	------

All models
Sale or Lease
On Line or Off Line
Lease SaleAvail now
Flexible Terms

dataserv CALL TOLL-FREE **1-800/328-6729**

Your Authority in the IBM Second Market IN MINNESOTA CALL COLLECT 612/933-2575

DATASERV BUILDING, 509 SECOND AVENUE S., PO. BOX 3003, HOPKINS, MINNESOTA 55343

Available For
December Delivery

DEC 11/44

Systems
Processors &
Memory

CRISIS
COMPUTER
CORP.

2356 Welch Ave. Santa Clara, CA 95051 408-727-0431

For domestic and international sales TWX 910-338-7330

DEC
COMPUTERS

VAX11/780,
11/70, 11/34A

COMPONENTS

TU77, TU45, TE16,
TS11, MS780
RPO6, RM03, RM05,
RK07, RL02

C.D. Smith & Assoc., Inc.
12600 East Freeway, #318
Houston, Texas 77015
Telex: 76-2547 CDSMITH HOU
713/451-3112

IDS international data
services, inc.

DEC
SYSTEMS

PDP 11/70's,
11/34's, 11/04's,
11/03's & Peripherals

BUY & SELL(408) 738-3368
telex 345 5921020 Stewart Drive
Sunnyvale, CA 94086

AVAILABLE

138's
148's

RANDOLPH
Computer Company
Division of The Bank of Boston
537 Steamboat Road
Greenwich, CT 06830
800-243-5307
(In Connecticut, 661-4200)
Member
Computer Leasers Association



WE PAY MORE
for used or obsolete computers,
peripherals, PC boards &
connectors. We are one of
the largest exporters of used
computers and electronic
equipment. Nationwide service.

Eastern Enterprises, Inc.
5455 Wilshire Blvd.
Los Angeles, CA 90036
(213) 934-4977

IBM
SYSTEM 38
disk drives

3370's Mod. A11 & B11

June 81

DP ENTERPRISES INC.
1320 Prospect St.
Seattle Washington 98109
206-822-7564

buy sell swap

CMIAMERICA'S
LEADING SPECIALIST
SERVING THE USED MARKET**3033**Lease Financing and
Purchase Leaseback
New and Used
Gary Smith**3032's**Sale, or Short Term Lease
Available Immediately
Bob LaurieWANT TO BUY
OR SUBLICENSE
3031

Bob Laurie

3168IBM/OEM Memory Channels
Short Term Lease or Purchase
Robbie Barnes**3158-3's**Priced to sell
Pam HobanAvailable for
Immediate Delivery**3031**
Sale or Lease
Bob Laurie**3148 3138**Lease or Sale
Immediate Delivery
Pam Hoban**4341**We Have 1st Quarter 1981
Delivery Positions**3276**3274/3278
3287/3289
Kay Richard**4331**

Immediate Delivery

BUY/SELL/LEASE

3380

Pat Callahan

SYSTEM 3Models
12 and 15
Dennis PenningtonCOMMUNICATIONS
Buy-Sell-Lease

IBM 3705

IBM 3704

Immediate Delivery Configured
To Your Requirements
Pat Ducey**CMI** CORPORATION

755 W. Big Beaver, 19th Floor, Troy, Michigan, 48084

(313) 362-1000

MARKETINGDallas, Texas (214) 385-0806
Long Island, New York (516) 673-9517New Jersey (609) 645-7282
Montreal, Quebec (514) 288-8455Windsor, Ontario (519) 258-8910
Geneva, Switzerland Telex: 289073 CMI CHParis, France Telex: 613910 CMI FR
Hamburg, W. Germany Telex: 211897 CMIHD D**CMI FINANCIAL SERVICES, INC.**755 W. Big Beaver, 20th Floor, Troy, Mich. 48084
(313) 362-1000

Member CDA/CLA

Fully compatible **DEC** systems and peripherals

NRWM05	300 MB & controller	\$20,500
NRJM05	300 MB & controller	\$18,800
NRM05	300 MB slave drive	\$13,600
NRWP06	200 MB & controller	\$19,600
NRJP06	200 MB & controller	\$17,900
NRP06	200 MB slave drive	\$12,600
NRWM03	80 MB & controller	\$14,800
NRJM03	80 MB & controller	\$13,100
NRM03	80 MB slave drive	\$7,900
NTJ45	45 IPS type & controller	\$7,300
NTJ75	75 IPS type & controller	\$8,600
NTJ125	125 IPS type & controller	\$9,800
11/70, 11/44, 11/34, 11/23, VAX systems		

NORDATANationwide installation and maintenance
4433 27th Ave. W., Seattle, WA 98199

Toll Free 800-426-2929 in Washington 206-282-1170

"HOT VALUES"

Nova 1200-7/1200 Jumbo; 32KB.....	\$2,200/2,700
Nova 1200-7/1200 Jumbo; 84KB.....	\$3,300/3,800
NEW Eclipse S130; 128K ERCC Mos; MMPU; Battery Backup; List Price \$22,500.....	\$13,500.00
NEW Eclipse S140; 256KB ERCC Mos; ULM 5; D100 CRT. Licensed for RDOS.....	\$19,600.00
256KB Mos Memory for Nova 3 with ERCC.....	\$2,700.00
Nova 3; 64KB Mos; APL; PF/AR; BBU.....	\$4,500.00

FREE Evaluation and System Configuring Service

CALL TODAY

800-538-1740 (outside CA)
408-733-4400

minicomputer exchange inc.

BURROUGHS
BUY-SELL-LEASE

CPU's-B1800-B3700

B4700-B6700

B6800

Memory-Peripherals

DSI, INCORPORATED

2480 W. Alameda Ave

Denver, Colorado 80223

(303) 922-8331

Telex: 910-931-0483

Member Computer Dealers Association

BUY **SELL** **LEASE****370 PERIPHERALS**Disk Printers
Tape I/O**370 CPU's**135/145/155
138/148/158**GSD**Sys. 32/34/3C
All Sys. 3**DATA ENTRY**37XX/5496
All 3200**UNIT RECORD**029/129
083/557DAC Buys Rental Credit Equipment
Call or Write**DATA AUTOMATION CO., INC.**

4858 Cash Road

Dallas, Texas 75247

214 637-6570

TWX-910-861-4240

Member of Computer Dealer Association

WANTED3601 3A Controllers
3604 4 Display Units**PACIFIC COMPUTER
LEASING, INC.**
(206) 271-5000**3350B2**AVAILABLE FOR
LEASE OR SALENF COMPUTER SALES
& LEASING CORP.

OAK BROOK, IL 60521-8181 MINNEAPOLIS, MN 55414-1018

HOW FAST ARE WE? Call Us Now!
Most Equipment In Stock
For Immediate DeliveryBuy • Sell • Trade • New And Used
DATA GENERAL • DEC

- Ampex
- Century Data
- Printronics
- Data Products

- Tandberg
- CDC
- Soroc
- Hazeline
- Diablo
- Centronics
- Western Dynex
- GE

DATA GENERAL		DEC
•Eclipse 3000	New	1,100
•Eclipse 3000 Controller	1500	1100
•Eclipse 3000 MOS	800	800
•New D/100, D/200, QTY. DISC.	—	MS 11LD.....
•Various DG Modules.....STOCK	—	MS 11JP.....
	—	Various DEC Modules.....STOCK

Computer Resale Consulting Inc.
490 West Main St., Avon, MA. 02322
Call George Trawinski (617) 583-8460
Out Of State 800-343-1092 TWX/TELEX 7103451290
DG Peripheral And Board Repair Available

buy sell swap

OFF-THE-SHELF PRINTERS FOR YOUR DEC MINI.



Call the Printer Store hotline, (800) 243-9054, for immediate delivery on any of 27 models in 5 printing technologies. Ask for our DEC specialist, Mike Welby.

The Printer Store
Digital Associates Corporation
1039 E. Main St., Stamford, CT 06902 TWX 710-474-4583
(800) 243-9054 In Ct call (203) 327-9210

BUY • SELL • LEASE • TRADE

SYSTEM 3 15D
Available Immediately
Sale or Lease
SYSTEM 34 or 38
Purchase/Leaseback
Substantial Savings
Call for a Quote
(612) 546-0207

**NORTHERN
GROUP LTD., INC.**
2144 18th CENTER
MINNEAPOLIS, MN 55402
System 34's
Urgently
Needed

WAREHOUSE CLEARANCE SALE DEC® EQUIPMENT

Our lease has expired, and we've been forced to move our warehouse. The following equipment is available for immediate delivery:

MODEL	DESCRIPTION	QUANTITY
RP06-AA	176 MB DISK DRIVE	3
RM03-AA	67 MB DISK DRIVE	4
TS11	TAPE DRIVE	1
MS780-DC	1024 KB MOS MEMORY - VAX	1
FP780-AA	VAX FLOATING POINT	1
MS780-DD	2048 KB MOS MEMORY - VAX	1
RK711	CONTROLLER ONLY	1
DZ11-E	16 LINE MULTIPLEXER	3
DZ11-B	8 LINE EXPANDER	1
DZ11-A	8 LINE MULTIPLEXER	3
RJM02	DISK DRIVE	1
RH70-AA	11/70 MASS BUS CONTROLLER	1
RP06-AA	176 MB DISK DRIVE (USED)	3
DH11-AD	MULTIPLEXER	1
VT100	VIDEO TERMINALS	70
LA36-AA	PRINTING TERMINALS	3

All equipment is new unless otherwise specified.
Digital installation and warranty are provided.

Call (617) 489-3550 or write



INTERACTIVE
MANAGEMENT
SYSTEMS
375 Concord Ave., Belmont, MA 02178

2Yr LEASE ON ANY 303X C.P.U.

For more information call:
Charlie Albright
212-482-8640



Sha-Li Leasing Associates, Inc.
40 Wall Street
Suite 4206
New York, New York 10005

SALE or LEASE (We're sole owners)
IBM 4341 Model L
P.O. #3737YV Avail 1/23/81

3742 DATA STATIONS from \$3,195.00
(\$135 per mo. - 24 mo. lease)

IBM 4341 Group II On Order

IBM 029 ALL MODELS FROM \$1575.00

129-3 from \$2,850.00

CALL GEORGE GILMAN
I.O.A. DATA CORP.

Toll Free 800-221-8438
N.Y. (212) 673-9300
363 Lafayette Street, New York, N.Y. 10003



DEC EQUIPMENT AVAILABLE

*PDP 11/34A

*PDP 11/70

*VT100s
and other
DEC Systems

*PLUS
COMPLETE LINE
OF COMPATIBLE
DISKS-80-300MB
MAG TAPES
MEMORIES

We deal in a wide variety of
DEC equipment

Tymshare field maintenance
is also available for your
DEC system

FOR INFORMATION
AND BROCHURE CALL

800-423-5321

(IN CALIF)

213-889-6031



Equipment Support Division

WANTED!

NCR
ELECTRONIC EQUIPMENT

SMITH ANDERSON CORP.

68-757 SUMMIT DRIVE
CATHEDRAL CITY, CA 92324
(714) 346-3227
(714) 324-4427

FOR SALE MEMOREX

- 3228 TAPE DRIVES
- 3221 CONTROLLERS
- 3675 DISKS, 400MB
- 3674 CONTROLLERS

Certified for Memorex Maintenance

IBM

- 3777 COM TERMINAL
Now Under IBM Maintenance

Contact: Phil Schlesinger

COMSHARE INCORPORATED

P.O. Box 1588

Ann Arbor, MI 48106

313/994-4800

Computer for
Distributor/Small Mfg.

DG Micro Nova 64 KB w/10mb
fixed/removable disc in half-bay
Cabinet, SD floppy, 2-CRTs,
Centronics 704 Matrix Printer.

On manufacturers
service contract.

Software: O/E, Inventory,
Standard Account Applications.

Available 2-11-81

704/393-3396

Honeywell
Equipment
For Sale

- | | |
|------------|------------------------------|
| (1) 2201-7 | Central Processor (128K) |
| (1) 2038-6 | Tape Control |
| (7) 2048-9 | Magnetic Tape Unit |
| (1) 0191 | Option Instruction Package |
| (1) 050 | IBM Format Feature |
| (1) 051 | IBM Code Compat. Feature |
| (1) 1115 | 2nd Input/Output Sector |
| (1) 1117 | Storage Protection |
| (1) 1121 | Ext. Multi-prog. & 8-bit Trl |
| (1) 213-3 | Interval Timer |

Call Mr. John Brady
212/957-4000

For Sale By Owner
Perkin-Elmer
Model 7/32 C-II

258K memory
(2) 80 megabyte disk drives
Floating point hardware
1600 BPI tape drive
(8) Perkin-Elmer model 1200
CRT's with function keys
(6) Texas Instruments model
810 printers
(1) Printronics 300 LPM printer
All items covered by Perkin-Elmer
maintenance.

Contact Lee Turner
308/485-4236

\$15K = 112K
BURROUGHS B877 SYSTEM

112K Processor
37.6 mb fixed disk
(2) removable 1 mb disk
(1) 10KVA Isolation transformer
(1) TD 850 CRT operator console
(2) Hazeline mod. 1 polling terminals

All this for \$15,000
Call Immediately
Monroe County Water Authority
716/442-2000

VAX
For Sale
New and Used

- Jan.-Feb. Delivery
- RP06 — RM03's
- Data Boss/32 Database Management System
- Call J. Wright
305/652-1710
- Florida Computer, Inc.

FOR SALE!

- Series 1
- 3741
- 1130-2C sys.

CALL NOW! 617-437-1100
AMERICAN USED COMPUTER
P.O. Box 68, Boston, MA 02215

BUY & SELL ALL WANG COMPUTER EQUIPMENT & WORD PROCESSORS 617/372-8536 CFR ASSOCIATES, INC. 18 GRANITE STREET HAVERHILL, MA. 01830

DIEBOLD COMPUTER LEASING BUY•SELL•LEASE

ALL CPU's & PERIPHERALS

360 303X 4300 Series

IBM CARD READERS & PUNCHES PRINTERS CONTROLLERS AVAILABLE NOW

CALL 800-631-1602 201-569-3838 TWX 710-991-9733

177 North Dean Street, Englewood, New Jersey 07631
Member: Computer Lessors Association and Computer Dealers Association

PDP8 16 SECTOR PACKS & DECTAPES & FLOPPIES

We offer these packs with 10-days return on any damaged units. Any damaged units will be replaced within 10-day trial period. Some units have programs and/or data. We have too many to check them, but all have been certified. Exchanges possible, but no refunds at these prices.

RX05-XX 16 Sector Disk Pack	\$ 42.00
TD5-E or TC01 Dectapes	5.50
RX01 Single Density one sided Floppy	2.50

Federated Consultants, Inc.
1218 S. Ervay
Dallas, Tx. 75215

TIGER COMPUTER
415 Madison Ave., New York, N.Y. 10017, (212) 532-1500

Short/Term Lease
3158-K
W/2150,
2151,
6111, 4650
Available immediately

3031/
3032/
3033
Purchase/Leaseback

Buy/Sell/Trade
3830-1's
3830-2's
3830-3's
3830-4's
3830-5's
3830-6's
3830-7's
3830-8's
3830-9's
3830-10's
3830-11's
3830-12's
3830-13's
3830-14's
3830-15's
3830-16's
3830-17's
3830-18's
3830-19's
3830-20's
3830-21's
3830-22's
3830-23's
3830-24's
3830-25's
3830-26's
3830-27's
3830-28's
3830-29's
3830-30's
3830-31's
3830-32's
3830-33's
3830-34's
3830-35's
3830-36's
3830-37's
3830-38's
3830-39's
3830-40's
3830-41's
3830-42's
3830-43's
3830-44's
3830-45's
3830-46's
3830-47's
3830-48's
3830-49's
3830-50's
3830-51's
3830-52's
3830-53's
3830-54's
3830-55's
3830-56's
3830-57's
3830-58's
3830-59's
3830-60's
3830-61's
3830-62's
3830-63's
3830-64's
3830-65's
3830-66's
3830-67's
3830-68's
3830-69's
3830-70's
3830-71's
3830-72's
3830-73's
3830-74's
3830-75's
3830-76's
3830-77's
3830-78's
3830-79's
3830-80's
3830-81's
3830-82's
3830-83's
3830-84's
3830-85's
3830-86's
3830-87's
3830-88's
3830-89's
3830-90's
3830-91's
3830-92's
3830-93's
3830-94's
3830-95's
3830-96's
3830-97's
3830-98's
3830-99's
3830-100's
3830-101's
3830-102's
3830-103's
3830-104's
3830-105's
3830-106's
3830-107's
3830-108's
3830-109's
3830-110's
3830-111's
3830-112's
3830-113's
3830-114's
3830-115's
3830-116's
3830-117's
3830-118's
3830-119's
3830-120's
3830-121's
3830-122's
3830-123's
3830-124's
3830-125's
3830-126's
3830-127's
3830-128's
3830-129's
3830-130's
3830-131's
3830-132's
3830-133's
3830-134's
3830-135's
3830-136's
3830-137's
3830-138's
3830-139's
3830-140's
3830-141's
3830-142's
3830-143's
3830-144's
3830-145's
3830-146's
3830-147's
3830-148's
3830-149's
3830-150's
3830-151's
3830-152's
3830-153's
3830-154's
3830-155's
3830-156's
3830-157's
3830-158's
3830-159's
3830-160's
3830-161's
3830-162's
3830-163's
3830-164's
3830-165's
3830-166's
3830-167's
3830-168's
3830-169's
3830-170's
3830-171's
3830-172's
3830-173's
3830-174's
3830-175's
3830-176's
3830-177's
3830-178's
3830-179's
3830-180's
3830-181's
3830-182's
3830-183's
3830-184's
3830-185's
3830-186's
3830-187's
3830-188's
3830-189's
3830-190's
3830-191's
3830-192's
3830-193's
3830-194's
3830-195's
3830-196's
3830-197's
3830-198's
3830-199's
3830-200's
3830-201's
3830-202's
3830-203's
3830-204's
3830-205's
3830-206's
3830-207's
3830-208's
3830-209's
3830-210's
3830-211's
3830-212's
3830-213's
3830-214's
3830-215's
3830-216's
3830-217's
3830-218's
3830-219's
3830-220's
3830-221's
3830-222's
3830-223's
3830-224's
3830-225's
3830-226's
3830-227's
3830-228's
3830-229's
3830-230's
3830-231's
3830-232's
3830-233's
3830-234's
3830-235's
3830-236's
3830-237's
3830-238's
3830-239's
3830-240's
3830-241's
3830-242's
3830-243's
3830-244's
3830-245's
3830-246's
3830-247's
3830-248's
3830-249's
3830-250's
3830-251's
3830-252's
3830-253's
3830-254's
3830-255's
3830-256's
3830-257's
3830-258's
3830-259's
3830-260's
3830-261's
3830-262's
3830-263's
3830-264's
3830-265's
3830-266's
3830-267's
3830-268's
3830-269's
3830-270's
3830-271's
3830-272's
3830-273's
3830-274's
3830-275's
3830-276's
3830-277's
3830-278's
3830-279's
3830-280's
3830-281's
3830-282's
3830-283's
3830-284's
3830-285's
3830-286's
3830-287's
3830-288's
3830-289's
3830-290's
3830-291's
3830-292's
3830-293's
3830-294's
3830-295's
3830-296's
3830-297's
3830-298's
3830-299's
3830-300's
3830-301's
3830-302's
3830-303's
3830-304's
3830-305's
3830-306's
3830-307's
3830-308's
3830-309's
3830-310's
3830-311's
3830-312's
3830-313's
3830-314's
3830-315's
3830-316's
3830-317's
3830-318's
3830-319's
3830-320's
3830-321's
3830-322's
3830-323's
3830-324's
3830-325's
3830-326's
3830-327's
3830-328's
3830-329's
3830-330's
3830-331's
3830-332's
3830-333's
3830-334's
3830-335's
3830-336's
3830-337's
3830-338's
3830-339's
3830-340's
3830-341's
3830-342's
3830-343's
3830-344's
3830-345's
3830-346's
3830-347's
3830-348's
3830-349's
3830-350's
3830-351's
3830-352's
3830-353's
3830-354's
3830-355's
3830-356's
3830-357's
3830-358's
3830-359's
3830-360's
3830-361's
3830-362's
3830-363's
3830-364's
3830-365's
3830-366's
3830-367's
3830-368's
3830-369's
3830-370's
3830-371's
3830-372's
3830-373's
3830-374's
3830-375's
3830-376's
3830-377's
3830-378's
3830-379's
3830-380's
3830-381's
3830-382's
3830-383's
3830-384's
3830-385's
3830-386's
3830-387's
3830-388's
3830-389's
3830-390's
3830-391's
3830-392's
3830-393's
3830-394's
3830-395's
3830-396's
3830-397's
3830-398's
3830-399's
3830-400's
3830-401's
3830-402's
3830-403's
3830-404's
3830-405's
3830-406's
3830-407's
3830-408's
3830-409's
3830-410's
3830-411's
3830-412's
3830-413's
3830-414's
3830-415's
3830-416's
3830-417's
3830-418's
3830-419's
3830-420's
3830-421's
3830-422's
3830-423's
3830-424's
3830-425's
3830-426's
3830-427's
3830-428's
3830-429's
3830-430's
3830-431's
3830-432's
3830-433's
3830-434's
3830-435's
3830-436's
3830-437's
3830-438's
3830-439's
3830-440's
3830-441's
3830-442's
3830-443's
3830-444's
3830-445's
3830-446's
3830-447's
3830-448's
3830-449's
3830-450's
3830-451's
3830-452's
3830-453's
3830-454's
3830-455's
3830-456's
3830-457's
3830-458's
3830-459's
3830-460's
3830-461's
3830-462's
3830-463's
3830-464's
3830-465's
3830-466's
3830-467's
3830-468's
3830-469's
3830-470's
3830-471's
3830-472's
3830-473's
3830-474's
3830-475's
3830-476's
3830-477's
3830-478's
3830-479's
3830-480's
3830-481's
3830-482's
3830-483's
3830-484's
3830-485's
3830-486's
3830-487's
3830-488's
3830-489's
3830-490's
3830-491's
3830-492's
3830-493's
3830-494's
3830-495's
3830-496's
3830-497's
3830-498's
3830-499's
3830-500's
3830-501's
3830-502's
3830-503's
3830-504's
3830-505's
3830-506's
3830-507's
3830-508's
3830-509's
3830-510's
3830-511's
3830-512's
3830-513's
3830-514's
3830-515's
3830-516's
3830-517's
3830-518's
3830-519's
3830-520's
3830-521's
3830-522's
3830-523's
3830-524's
3830-525's
3830-526's
3830-527's
3830-528's
3830-529's
3830-530's
3830-531's
3830-532's
3830-533's
3830-534's
3830-535's
3830-536's
3830-537's
3830-538's
3830-539's
3830-540's
3830-541's
3830-542's
3830-543's
3830-544's
3830-545's
3830-546's
3830-547's
3830-548's
3830-549's
3830-550's
3830-551's
3830-552's
3830-553's
3830-554's
3830-555's
3830-556's
3830-557's
3830-558's
3830-559's
3830-560's
3830-561's
3830-562's
3830-563's
3830-564's
3830-565's
3830-566's
3830-567's
3830-568's
3830-569's
3830-570's
3830-571's
3830-572's
3830-573's
3830-574's
3830-575's
3830-576's
3830-577's
3830-578's
3830-579's
3830-580's
3830-581's
3830-582's
3830-583's
3830-584's
3830-585's
3830-586's
3830-587's
3830-588's
3830-589's
3830-590's
3830-591's
3830-592's
3830-593's
3830-594's
3830-595's
3830-596's
3830-597's
3830-598's
3830-599's
3830-600's
3830-601's
3830-602's
3830-603's
3830-604's
3830-605's
3830-606's
3830-607's
3830-608's
3830-609's
3830-610's
3830-611's
3830-612's
3830-613's
3830-614's
3830-615's
3830-616's
3830-617's
3830-618's
3830-619's
3830-620's
3830-621's
3830-622's
3830-623's
3830-624's
3830-625's
3830-626's
3830-627's
3830-628's
3830-629's
3830-630's
3830-631's
3830-632's
3830-633's
3830-634's
3830-635's
3830-636's
3830-637's
3830-638's
3830-639's
3830-640's
3830-641's
3830-642's
3830-643's
3830-644's
3830-645's
3830-646's
3830-647's
3830-648's
3830-649's
3830-650's
3830-651's
3830-652's
3830-653's
3830-654's
3830-655's
3830-656's
3830-657's
3830-658's
3830-659's
3830-660's
3830-661's
3830-662's
3830-663's
3830-664's
3830-665's
3830-666's
3830-667's
3830-668's
3830-669's
3830-670's
3830-671's
3830-672's
3830-673's
3830-674's
3830-675's
3830-676's
3830-677's
3830-678's
3830-679's
3830-680's
3830-681's
3830-682's
3830-683's
3830-684's
3830-685's
3830-686's
3830-687's
3830-688's
3830-689's
3830-690's
3830-691's
3830-692's
3830-693's
3830-694's
3830-695's
3830-696's
3830-697's
3830-698's
3830-699's
3830-700's
3830-701's
3830-702's
3830-703's
3830-704's
3830-705's
3830-706's
3830-707's
3830-708's
3830-709's
3830-710's
3830-711's
3830-712's
3830-713's
3830-714's
3830-715's
3830-716's
3830-717's
3830-718's
3830-719's
3830-720's
3830-721's
3830-722's
3830-723's
3830-724's
3830-725's
3830-726's
3830-727's
3830-728's
3830-729's
3830-730's
3830-731's
3830-732's
3830-733's
3830-734's
3830-735's
3830-736's
3830-737's
3830-738's
3830-739's
3830-740's
3830-741's
3830-742's
3830-743's
3830-744's
3830-745's
3830-746's
3830-747's
3830-748's
3830-749's
3830-750's
3830-751's
3830-752's
3830-753's
3830-754's
3830-755's
3830-756's
3830-757's
3830-758's
3830-759's
3830-760's
3830-761's
3830-762's
3830-763's
3830-764's
3830-765's
3830-766's
3830-767's
3830-768's
3830-769's
3830-770's
3830-771's
3830-772's
3830-773's
3830-774's
3830-775's
3830-776's
3830-777's
3830-778's
3830-779's
3830-780's
3830-781's
3830-782's
3830-783's
3830-784's
3830-785's
3830-786's
3830-787's
3830-788's
3830-789's
3830-790's
3830-791's
3830-792's
3830-793's
3830-794's
3830-795's
3830-796's
3830-797's
3830-798's
3830-799's
3830-800's
3830-801's
3830-802's
3830-803's
3830-804's
3830-805's
3830-806's
3830-807's
3830-808's
3830-809's
3830-810's
3830-811's
3830-812's
3830-813's
3830-814's
3830-815's
3830-816's
3830-817's
3830-818's
3830-819's
3830-820's
3830-821's
3830-822's
3830-823's
3830-824's
3830-825's
3830-826's
3830-827's
3830-828's
3830-829's
3830-830's
3830-831's
3830-832's
3830-833's
3830-834's
3830-835's
3830-836's
3830-837's
3830-838's
3830-839's
3830-840's
3830-841's
3830-842's
3830-843's
3830-844's
3830-845's
3830-846's
3830-847's
3830-848's
3830-849's
3830-850's
3830-851's
3830-852's
3830-853's
3830-854's
3830-855's
3830-856's
3830-857's
3830-858's
3830-859's
3830-860's
3830-861's
3830-862's
3830-863's
3830-864's
3830-865's
3830-866's
3830-867's
3830-868's
3830-869's
3830-870's
3830-871's
3830-872's
3830-873's
3830-874's
3830-875's
3830-876's
3830-877's
3830-878's
3830-879's
3830-880's
3830-881's
3830-882's
3830-883's
3830-884's
3830-885's
3830-886's
3830-887's
3830-888's
3830-889's
3830-890's
3830-891's
3830-892's
3830-893's
3830-894's
3830-895's
3830-896's
3830-897's
3830-898's
3830-899's
3830-900's
3830-901's
3830-902's
3830-903's
3830-904's
3830-905's
3830-906's
3830-907's
3830-908's
3830-909's
3830-910's
3830-911's
3830-912's
3830-913's
3830-914's
3830-915's
3830-916's
3830-917's
3830-918's
3830-919's
3830-920's
3830-921's
3830-922's
3830-923's
3830-924's
3830-925's
3830-926's
3830-927's
3830-928's
3830-929's
3830-930's
3830-931's
3830-932's
3830-933's
3830-934's
3830-935's
3830-936's
3830-937's
3830-938's
3830-939's
3830-940's
3830-941's
3830-942's
3830-943's
3830-944's
3830-945's
3830-946's
3830-947's
3830-948's
3830-949's
3830-950's
3830-951's
3830-952's
3830-953's
3830-954's
3830-955's
3830-956's
3830-957's
3830-958's
3830-959's
3830-960's
3830-961's
3830-962's
3830-963's
3830-964's
3830-965's
3830-966's
3830-967's
3830-968's
3830-969's
3830-970's
3830-971's
3830-972's
3830-973's
3830-974's
3830-975's
3830-976's
3830-977's
3830-978's
3830-979's
3830-980's
3830-981's
3830-982's
3830-983's
3830-984's
3830-985's
3830-986's
3830-987's
3830-988's
3830-989's
3830-990's
3830-991's
3830-992's
3830-993's
3830-994's
3830-995's
3830-996's
3830-997's
3830-998's
3830-999's
3830-1000's
3830-1001's
3830-1002's
3830-1003's
3830-1004's
3830-1005's
3830-1006's
3830-1007's
3830-1008's
3830-1009's
3830-1010's
3830-1011's
3830-1012's
3830-1013's
3830-1014's
3830-1015's
3830-1016's
3830-1017's
3830-1018's
3830-1019's
3830-1020's
3830-1021's
3830-1022's
3830-1023's
3830-1024's
3830-1025's
3830-1026's
3830-1027's
3830-1028's
3830-1029's
3830-1030's
3830-1031's
3830-1032's
3830-1033's
3830-1034's
3830-1035's
3830-1036's
3830-1037's
3830-1038's
3830-1039's
3830-1040's
3830-1041's
3830-1042's
3830-1043's
3830-1044's
3830-1045's
3830-1046's
3830-1047's
3830-1048's
3830-1049's
3830-1050's
3830-1051's
3830-1052's
3830-1053's
3830-1054's
3830-1055's
3830-1056's

buy sell swap

**FOR SALE
BY OWNER**

**NEW
DEC 11/70**
(RPO6 based SM70CVA-CA)
Immediate Delivery

from Warehouse
in unopened cratesDEC installation
and warranty!*** END USERS ONLY ***Contact:
Director of
Computer OperationsEdwin S. Freeman
(212) 285-0282
(212) 285-0273**IPS Computer Marketing Corp.**

MACK CENTRE II MACK CENTRE DR. PARAMUS, NJ 07652

WANTED 3032 CPU Call: TED MOLINARI	FOR 3033, 3032 & 3168's Call: TED MOLINARI	AVAILABLE 3033 NB April '81	158K SALE OR LEASE MAKE OFFER TO: TED MOLINARI	WANTED 3031 168 158 Memory Jan '81
AVAILABLE 3420-4 Tapes Jan. delivery	AVAILABLE 3803-1 3420-7's Feb. '81	CANADA Call: FRANK CAMPAGNA	AVAILABLE 3145-12 3145/135 Memory	AVAILABLE 3350-A2F & B2F Feb. delivery
BUY/SELL 3350-A2/B2/C2 3340-A2/3344-B2 Jan. delivery	4341K 2/27/81 delivery Group II Upgrade 9/81	WANTED 3420-5/7/8 single density dual density	3333-11 3330-11 AVAILABLE 2/16/81	WANTED 3420-8's 3803-2's

TELEPHONE:(201) 262-9500 Telex:642-197 IPSPARA

DEC

D534; 11/34 CPU,
256Kb Core, LA36
Console, TGU16
Tape Drive & Control,
3-RPR02 Disk Drives
and Control RSTS/E
Ver 7.0 License
Ph. 219-232-7921

4341

- Systems Available For Lease
- 1st Quarter 1981 Deliveries

COMDISCO
CALL YOUR LOCAL OFFICE OR
KAREN JOHNS
312-698-3000

FOR SALE - IMMEDIATE DELIVERY**4331 SYSTEM - 1MB**

4331-J	CPU (#10075)	3278-A2	Console (#88033)
1421	Block Mux Channel	3310-A2	Disk (#20275)
1601	Communications Adapter	3310-B2	Disk (#40216)
1901	Expanded Ctl. Storage	1403-N1	Printer (#34998)
3201	DASD Adapter	2540-1	Reader/Punch (#17288)
3401	Diskette Drive	2821-1	Control (#15168)
3701	EIA Interface		
4695	Line Attachment (2)		
4696	Line Attachment		
4782	1200 BPS Modem		
5531	Power Interface		
5248	Byte Mux Channel		

\$140,000**Computer Merchants Inc.**75 South Greeley Avenue • Chappaqua, N.Y. 10514
(914) 238-9631**FOR SALE
PDP 11/70**
Digital Equipment Computer

PDP 11/70 central processor 64K words,
RPO4 disc with controller, TUW16 1800/800
bpi magnetic tape controller with TU16 tape
drive.
MU1-AE 32K words
H800-DH expander cabinet
DH11-AD 16 line multiplexer (two)
BC05D-10 modem cable (16)
DD11-B peripheral mounting panel
DU11-D synchronous line unit full-half duplex
synchronous interface
KG11-A communications arithmetic option
DFC11-A clock option
BC03M-25 null modem cable
VT50-HA CRT
LA30 Displaywriter

For details, description or bid submission
contact:

Clifford D. Sibley
Lincoln Public Schools
720 South 22
Lincoln, Nebraska 68510
402-473-0222

BROOKVALE ASSOCIATES

BUY • SELL • RENT • TRADE

DEC

11/03-LK	64Kb MOS	RX211BA	1mb floppy
11/23-AA	128Kb MOS	RK05-AA	2.5mb drive
11/34-DE	32Kb MOS	RK05F-FA	5mb drive
11/45	64-256Kb Par Core	RK06-EA	14mb drive
11/70VA	256Kb Core	RK07-EA	28mb drive
VAX11/780	Call for details	RM03-AA	67mb drive

(800) 645-1167 • NEW YORK (516) 567-7777

40 ORVILLE DRIVE • BOHEMIA, NEW YORK 11716

DEC**AVAILABLE IN STOCK****DEC**

PDP 8 systems and accessories in stock.

11/34A CPU's and Systems.

11/70 CPU's with 50 hz or 60hz, 64kb to 512kb.

NEW 11/23 CPU's with Dual RL01's In Stock

DZ11A	\$2500 New
FP11A	\$3200 New
KW11K	\$ 800 Used
MS11LD	\$6000 New

ICS 11-MA Industrial control sub-system 50% off list
H775A and BA backups (year end clearance)

Several other Peripherals, systems, etc.

SWA South West AutomationHome Office (Katy, TX)
713/371-9288West Coast Office (Sunnyvale, CA)
408/734-1117**DEC SALE****PDP11 CPU'S** **PDP11 MEMORY** **PDP11 OPTIONS**

11/04-LC	MS11-LB	DU11-DA
11/34A-DE	MJ11-BE	FP11-A
11/34A-LE	MK11-BE	FP11-C

MSI MIDWEST SYSTEMS, INC.
1118 East Highway 13, Burnsville, Minnesota 55337
(612) 894-4020

Bankruptcy Auction

By Authority of the Bankruptcy Court Eastern Div. of Tenn.

Assets of

TENNECOMP SYSTEMS, INC.
1400 Sixth Ave.
Knoxville, TN

FRIDAY, Feb. 6th 10 AM EST

Tennecomp designed and manufactured computers for the Nuclear Industry. To be sold are; Computers and Computer Components. This is the second phase of the liquidation of this company. Contact auctioneer for complete information on items to be sold. Inspection: Thu. Feb. 5th 9:00 am - 5:00 pm. Terms: Cash



FURROW AUCTION
REAL ESTATE BROKERS • INDUSTRIAL AUCTIONEERS

BOX 2087 • KNOXVILLE, TN. 37901 • PH. 615/546-3206

4341-L1

SHIP DATE

2/20/81

GROUP 2 UPGRADE

SHIP DATE

8/21/81

TO SELL OR LEASE

MAJOR COMPUTER INC.

612/933-6000

For Sale By Owner
DEC 11/34A

96K - core

56 meg - disks

4 - CRT's

1 - character printer (LA180)

1 DZ11-A - Multiplexor

3 DL11WC's

1 cabinet

DEC maintained

10 disks plus

Available March

Call Elliott Singer
516/231-7788**FOR SALE
NCR-8200 EQUIPMENT**

2 128-KB CPU's	\$3,000 ea
1 349-300 Line Printer	4,000
1 349-100 Line Printer	3,000
5 656 Disc Drives (10MB ea)	4,000
7 796-101 CRT's	1,000

Contact:
Bob Miller
805-822-5811**FOR SALE OR LEASE****3276-2's****3278-2's****3287-2's**

LARGE QUANTITIES

IMMEDIATE AVAILABILITIES

Call 214/258-0541

METROPLEX COMPUTER COMPANY, INC.

320 Decker Drive • Suite 180

Irving, TX 75062

TWX 910-860-9265

**FOR SALE OR LEASE
Very Reasonable**

IBM 370/145 K2. 2 Meg-Loaded

IBM 370/145.1 Meg - 3 Chan

IBM 3704 AI Commun. Control

IBM 3284 Modem 2 Printer

\$850 per

IBM 370/148 ISC 6 mos.

or longer

IBM 148 Memory J - K

Please call: (209) 324-8495

Stamford Computer Group, Inc.

927 Westover Road

Stamford, CT 06902

FOR SALE:

IBM System 3 Model 10
5410 16K CPU
5203 300lpm printer
5424 A02 500/120 MFCU
5444 A02 9.9 MB FAST ACCESS
IBM maintained

Contact:
Kevin J. Mooney
814-789-6332
EAV
17 Marble Avenue
Pleasantville, NY 10570

buy sell swap

SERIES/1, SYSTEM/32, SYSTEM/34, SYSTEM/3, SYSTEM/38, PERIPHERALS

CASS MARKETING CAN DELIVER YOUR NEXT
IBM SYSTEM QUICKLY.

We specialize in full SERIES/1, SYSTEM/32,
SYSTEM/34, SYSTEM/3, and SYSTEM/38
systems, upgrades, or add-ons. We have our
own field engineers on staff to remove or
install your system. And all IBM systems
from Cass Marketing are guaranteed to
qualify for full IBM maintenance and support.
Cass Marketing Services is dedicated to the
more than 3 years. We take trade-ins, we offer leases, we
rent, we sell, and we buy. Call Cass Marketing now for any
equipment you don't see listed below.

AVAILABLE NOW:

- IBM 5285, Data Entry System
- All System/34 upgrades
- IBM SYSTEM/3 Model 15 - Various sizes
- IBM 4955-E System
- All SERIES/1, SYSTEM/34 configurations

WANT TO BUY:

- All SERIES/1, SYSTEM/34 configurations

Cass Marketing Services Inc.

535 N. Brand Blvd, Suite 838
Glendale, California 91203
(213) 956-4982 collect or
(800) 423-2662 toll
free outside Calif.

IBM SYSTEM 34 HUGE SAVINGS

Sacrifice of the Month
Short Term Rental & Leases
Immediate Delivery
Less Than IBM at any configuration
208-822-7564

DP ENTERPRISES INC.
1320 Prospect St., Seattle Wa. 98109

FOR LEASE OR SALE

Model	Description	Available
4341K	CPU	Now
3880	Control Unit	Now
3420-3	Disk	Now
3420-5	7-track	Now
3411-3 (370-125)	Attach.	Feb.
3410-3	9 track	Feb.
3335-1	Disk & controller	Feb.
3330-1	Disk Drive	Feb.
3310A2	Disk & controller	Feb.
(3) 370-125	CPU's	Now
1403N1	Line Printer	Now
1403-6	Line Printer	Now
3203-1	Line Printer	Now
1442N1	Card/Read/Punch	Feb.
Calcomp	CD14 & CD12	Now
Potter Printer	(1200 LPM's)	Now
2702	Trans Control Unit	Now
2821-2	Control Unit	Now
Call or write:	Leasing Dynamics, Inc.	Now
Affin: Tom Cutler		
1717 E. 9th St., Cleveland, OH 44114		
216/587-0100		

THIS
SPACE
FOR
HIRE.

[Inquire at Classified
Advertising Dept.]

SYSTEM 34's

F37

256K, 256MB disk

LEAPAK

INTERNATIONAL

April '81
delivery

817/268-0023

USED DEC PRICES REDUCED

RP03-AA 57MB	14,500
RP04-AA 8MB	9,000
RP05-AA 16MB	12,000
MU11-8 CHASSIS ONLY	MAKE OFFER
LA36 AS IS	MAKE OFFER
LA180 AS IS	MAKE OFFER
VT50-HA AS IS	MAKE OFFER

In stock, available immediately DEC maintained

NORDATA
Call Marilyn
Toll Free 800-426-2721

SYSTEM/3 Model 15D

For sale or lease

CPU-128K

Under IBM
maintenance
agreement

Call Bruce Bennett
(801) 359-8731

BUY - SELL - LEASE

.. 5110 ..

S/32, S/34

.. Series 1 ..

IBM MAINTENANCE GUARANTEED

(408) 425-7333

SOURCE
DATA PRODUCTS, INC.

IBM

5110 / 5120

SYS 32 SYS 34

BUY - SELL
IBM MAINTENANCE GUARANTEED

NATIONAL DATA SYSTEMS, INC. 50 Congress Street
50 Congress Street Boston, MA 02109 (617) 720-0370

BUY SELL
WANG
DEC • IBM
WORD
PROCESSORS

(617) 437-1100

AMERICAN USED COMPUTER

4701 Thru 481 Kenmore St., Boston, MA 02115

DEC 11/34A
RL02-RSTS/E SYSTEM
(SE-30MMA-CK)

SAVE \$5,000

Command Data
PHONE: 205/942-3156

Command Data Incorporated
165 West Valley Avenue
Suite 201
Birmingham, Alabama 35209

WANTED SYSTEMS 7

Ferguson
Manufacturing, Inc.

P.O. Box 408

Richmond, MO 64085

816-776-5855

EQUIPMENT AVAILABLE

Description	For Sale/ Lease	Date
-------------	--------------------	------

370/168

lease only
sale or lease
now

370/158

lease only
sale or lease
now

Two 158 - M34
(1433, 1434, 1435,
2150, 2151, 4650,
5552, 6111, 7840,
7905, 3058, 3213)

158 memory
one meg (CDC)

3058 for 158

Features 1434, 1850,
2150's, 7840's, 7905

370/145

sale or lease
now

145 - I
(6982, 7855, 3345,
3046, 8810, 3215)

145 - I
(6982, 6983, 7855,
8810, 3046, 3345-2,
3215)

Feature 6983, 6984

370/135

135 - FEO
(4670, 4672, 7855)

Memorex memory

370/125

125 - HOO
sale or lease
now

2835 - 2
2305 - 2

Other
sale
now

CONTACT:

LFC

Jack A. Northrop
Lease Financing Corporation
3 Radnor Corporate Center
100 Matsonford Road
Radnor, Pa. 19087
215/527-4450

DEC IMMEDIATELY AVAILABLE

Communications	Disks	Tape	Options
DZ11	DH11	RP08	RP11-C
DU11	DUP11	RP04	PP7900
DMC11	DL11E	RP03	BA11KF
DL11W	DL11A	RL02	KY11LB
		RL01	EMC11
		RK07	MR11EA
		RK08	M8031

OTHER OPTIONS AVAILABLE CALL FOR QUOTE

NATIONAL COMPUTER EXCHANGE
6990 ARAGON CIRCLE, SUITE 5
BUENA PARK, CALIFORNIA 90620
(714) 522-1870 — (800) 854-7224

Dealers in: IBM PROCESSORS/ PERIPHERALS

3/32 34/38 360/370 4300 303X SERIES 1 33XX 38XX

data3 computer corporation

1-800-328-3537
or 612-682-4884 collect

FOR SALE
OR LEASE!
LONG OR SHORT TERM!
LOW MONTHLY RATES!

CONTROLLERS AND PRINTERS
ANY TYPE KEYBOARD

WE OWN WHAT WE SELL!

60 3277-25

(214) 258-0541

METROPLEX COMPUTER COMPANY, INC.

320 Decker Drive • Suite 180
Irving, TX 75062



buy sell swap	buy sell swap	buy sell swap	buy sell swap	buy sell swap
<p>370/125'S 370/115'S For Sale* Lease* Purchase Purchase Leaseback Short Term Leases Available Also all Peripheral Units.</p> <p>CORPORATE COMPUTERS, INC. (203) 661-1500 115 Mason St., Greenwich, CT 06830 Member Computer Dealers Association</p>	<p>4331-J1 AVAILABLE NOW LEASE OR SALE</p> <p>NF COMPUTER SALES & LEASING CORP. OAK BROOK, IL MINNEAPOLIS, MN 312/920-8181 612/854-1018</p>	<p>SALE DATA GENERAL COMPUTER SYSTEMS & PERIPHERALS FOR SALE</p> <p>D100/D200/8055 CRTs 6045/6050 10Mb disks 6021 tape subsystem 4219 U/L case line printer CS/40 mod C3 & CS Nova 3/D w/160K memory Eclipse C/330, S/130, M600</p> <p>AMES SCIENCES, INC. 301/397-3140</p>	<p>PURCHASE</p> <p>Eclipse 256K memory 6040/6042 printers New S/140 system including: 256Mb memory, 16Mb disk set 160Mb disk subsystem 6020 D/D tape subsystem 8-line MUX, CAB, CRT's</p>	
<p>TELEX TAPE DRIVES</p> <p>For Sale 6420 Model 66 Call Mr. Stull 913-649-2190</p>	<p>DEC RM05-AA Immediate Delivery New — Includes Installation & Warranty \$33,000 Ph 219-232-7921</p>	<p>GROWING FASTER TO SERVE YOU BETTER! FOR LEASE LONG OR SHORT TERM</p> <p>SYSTEM 32's and 34's CRT's, CONTROLLERS, 5110's, 5120's, Series One (214) 258-0541</p> <p>MCC METROPLEX COMPUTER COMPANY, INC. 320 Decker Drive • Suite 180 • Irving, TX 75062 Tlx 810 860 2828</p>	 <p>MEMBER</p>	
<p>FOR SALE Diebold 910 Cash Machines ISC Teller Terminals Bunker Ramo Teller Terminals</p> <p>PACIFIC COMPUTER LEASING, INC. (206) 271-5000</p>	<p>FOR SALE DEC PDP 11/03 64K 2-RL01 1-VT100 1-LA180 For More Information Contact ANN MARIE (212) 233-8780</p>	<p>Want to Buy 1403-2 2821-2 for 360/30 Together or Separately Cusumano Bros. 10570 Gratiot Detroit, MI 48213 313/921-7100</p>	<p>For Sale By Owner PRIME 450 256K 96mb CMD 16 line AMLQ Price \$49,500 717/342-7495</p>	<p>Sale or Lease By Owner BASIC FOUR MODEL 610</p> <ul style="list-style-type: none"> (1) CPU 58K (2) 2500 Disk Drive 70mb (4) 7230 VDT's (1) 918 300 LPM Matrix Printer Lee Wald Co. c/o John Greenbaum 1401 Armour Rd. N. Kansas City, MO 64116 800-521-5670
<p>FOUR-PHASE Mini Computers Several Models Available for Sub-lease For further information Send requirements to: CW Box 2472 375 Cochituate Rd., Rte. 30 Framingham, MA 01701</p>	<p>DEC Available Now (2) RK06 14mb disk drives (2) RPR02 20mb disk drives plus (1) controller in cabinet (25) "Error-free" disk packs for RPR02 drives Call Frank O'Kane 213/441-3123 Franklin Computer Systems, Inc. 715 Fremont Ave. S. Pasadena, CA 91030</p>	<p>DEC 11/34A 256KB Dual RM02's CTS 500 (RSTS/E V.7) license Call Michael Lerner 312/459-9500</p>	<p>Data General D-200's New, Immediate Ship 20% off list Much larger discounts available to dealers or quantity buyers. Call today, supply limited The Computer Center 368 U.S. Rte. 1 Falmouth, ME 04105 207/781-2260</p>	<p>For Sale IBM 5120 with 5103 printer 120 CPM's Excellent Condition Contact Universal Construction Inc. P.O. Box 367 Carlisle, PA 17013 717/243-2086</p>
<p>Burroughs L3000 With paper tape unit Sigmon Enterprises 615-869-4755</p>	<p>Burroughs B-700 Series Console/Entry Computer System Includes: B-711 Processor 32KB memory B9480-22 dual disk drive A9249-1 85 line per minute printer B-889 disk control B9343-2 Console with 20 CPS printer. Original cost \$31,000 Make Offer Contact V.P. MIS Division Viacomm International Inc. 1-212-575-5175</p>	<p>WANTED The Clackamas Education Service District wishes to acquire certain Data General computer devices, units and components. To obtain a copy of detailed specifications and delivery requirements please contact Mr. Robert Rintoul, Clackamas Education Service District, Marylhurst, OR 97038. 503/635-4341. Completed proposals must reach us by Feb. 23, 1981.</p>	<p>FOR SALE 1 2311 DISK DRIVE 4 2301 DISK DRIVE 1 2481-01 DISK CONTROLLER 140 2311 DISK PACKS W. C. Nugent Owens/Corning Fiberglas Newark, Ohio 43055 (614) 345-3441</p>	<p>SOFTWARE FOR SALE</p>
<p>CDC COMPUTER MEMORY UNIT 2.5 Megabytes CDC/AMS Model 33158A Semiconductor 376/158 Memory with CDC Maintenance Certification</p> <p>Sale will be conducted by The University of Georgia on a sealed bid basis to be opened 16 FEB 81. For tech. information call Walter McRae, 404-542-3106. For bid documents call Property Control Office, 404-542-4390 or write The Univ. of Georgia, Property Control, Athens, Georgia 30602. ATTN: Larry G. Allen.</p>	<p>FOR SALE MASS. DIV. OF EMPLOY. SECURITY 7005 memory inventory 8 Banks 65K ea. = 524K words of extended memory Used on Univac 1100 and 1100/40 mainframes Contact: Victor Valaitis 617/727-8554</p>	<p>IBM 3 MODEL 12 96K Dual Processor 5471 P-KB 3340, Plus 8 3348 Disks 2 3277's 2 3741's (1 on-line) 1402 Model 2 Available April 15 (313) 273-4810 DP Manager 18656 Fitzpatrick Detroit, MI 48228</p>	<p>BURROUGHS (6) TD834'S AVAILABLE IMMEDIATELY CALL: NORMAN NORRIS (301) 845-7061 BESCHE OIL CO.</p>	
<p>S/3 MODEL 15 BUY/SELL IBM IMMEDIATE Call Collect: 404-252-7480 6065 Roswell Rd. Suite 320-Atlanta, GA</p>	<p>FOR SALE BUSINESS COMPUTER SYSTEM 1 - Ohio Scientific C3-OEM Dual Side Floppy - 2MHz 1 - Soroc Screen 1 - OMNI - 800 TI Printer All Equipment Run Less Than 100 Hours \$9,500 Call: (815) 381-1115</p>	<p>Available Now 11/44 System • 2 RK07s • QMMS Data Management M.E. Compton (203) 728-6777 Quodata</p>	<p>FOR SALE OR LEASE SYSTEM 3 MODEL 150</p> <ul style="list-style-type: none"> • 128K Memory • 3340 A2 Disk Drive • 3340 B2 Disk Drive • BST 750 LPM Printer • 3277 Model 1 Display Station • 3741 Direct Attached <p>AVAILABLE MAR. 31, 1981 Contact Wayne Dahlsten BACHMAN'S, INC. PH. 812-881-7879</p>	<p>NIXDORF 600 Integrated Application Software Packages call DATEK 81 Market Square Newington, CT 06111 (203) 667-3009</p>

software for sale	software for sale	software for sale	software for sale	software for sale
<p>innovative software for school administration</p> <p>THE SCHOOL SYSTEM</p> <p>Contact: Robert M. Delf Vice President, Marketing Columbia Computing Services, Inc. 8611 S. 212th Street Kent, Washington 98031 (206) 872-0283</p>	<ul style="list-style-type: none"> student scheduling marks reporting attendance transcripts report writer flexible data base design interactive and batch OS, DOS for IBM 370, 4300 fully documented and maintained over 75 standard output reports 	 <p>NEW LIFE FOR 1401 PROGRAMS</p> <p>CS-TRAN converts your 1401 object programs to COBOL for the mainframe or mini of your choice.</p> <p>CS-TRAN is the only translator that accepts your object programs, patched and all, yet allows you to include actual COBOL paragraph names and record definitions.</p> <p>If you'd like more details about new life for your 1401 programs just call or write Russ Sandberg.</p>	<p>FREE SOFTWARE COULD BE PICKING YOUR POCKET.</p> <p>When the software you get with your PDP-II purchase is not powerful enough, or specific enough, to handle your work, you'll pay in increased programmer time and system resources. That's why we developed WAFE, the program and file editor that's as strong as our WORD-II word processing system. Come to the experts for PDP-II software or turnkey systems.</p> <p>DPD Data Processing Design, Inc. 181 W. Orangethorpe, Suite F, Placentia, CA 92670, (714) 993-4160.</p>	<h2>SYSTEM/34 SOFTWARE</h2> <p>Paratext Word Processing \$500</p> <p>Full Service Text Editor Enter, Edit, Store Text Automatic Centering Automatic Justification 3 Print Programs Individual Forms Design</p> <p>Documentation Contracts Memos Sales Brochures Business Letters Marketing Campaigns</p> <p>General Ledger \$500</p> <p>On-line journal entries Completely interactive Easy correction of errors Concurrent periods Fast throughput Designed by accountants</p> <p>Consolidated reports Comparative reports Customize P&L statement Customize balance sheet Flexible chart of accounts Many report options</p> <p>For documentation, call Jeffrey Papows (617) 546-3413 Para Research, Rockport, Massachusetts 01966</p>
<p>the IBM Solution HASPBOX</p> <p>SOFTWARE RESULTS CORPORATION</p> <p>UT200BOX the CDC Solution</p> <p>RSTS•VAX•RSX! DATA COMMUNICATIONS</p> <p>• INSTALLATIONS THROUGHOUT NORTH AMERICA AND EUROPE • FRONT END PROCESSOR-BASED FOR LOW OVERHEAD • FULL LINE UTILIZATION FOR HI-THROUGHPUT (UP TO 15.2 KB) • USER INTERFACE DESIGNED FOR RELIABILITY AND SIMPLICITY</p> <p>614/421-2094 COLUMBUS, OH 43212-USA TWX 810-482-1631</p>	<p>Installed Nationwide \$1350.</p> <p>AccounTech</p> <p>28104 Orchard Lake Road, Suite 108 Farmington Hills, Michigan 48018 (313) 626-0770</p>	<p>System/34 Small Business Financial Planning and Modeling System</p>	<p>MAPS™ Financial Modeling</p> <p>MAPS, recognized worldwide for over five years as a leader in financial modeling and reporting, is used to construct budgets, financial forecasts, consolidations and "what if" analyses.</p> <p>Call us at (415) 856-1100</p> <p>ROSS SYSTEMS INCORPORATED</p>	<p>1900 Embarcadero Road • Suite 208 • Palo Alto, California 94303</p>
<p>SERIES/1 DATA ENTRY SYSTEM</p> <p>Data Entry using IBM IDES II is now available on EDX operating systems utilizing 4978 or 3101 terminals. Our product is powerful enough to replace CMC/PERTEC*, ENTREX*, FOUR PHASE*, CADF* key disk system in a single partition program. Demonstration and trial installation available immediately. Direct inquiries to:</p> <p>Datronics Systems, Inc. 940 Springcreek Pkwy. Piano, TX 75023 214/422-7711</p>	<p>DEC NEWLY ENHANCED SOFTWARE PACKAGES</p> <ul style="list-style-type: none"> ORDERING PROCESSING - \$10,000 <ul style="list-style-type: none"> Order Entry/Invoicing Pick Lists or Work Orders Inventory Control Accts. Rec./Sales Analysis Purchasing MFG. CONTROL - \$ 5,000 <ul style="list-style-type: none"> BOM Processing Raw Materials Invent. Cont. Cost Analyses GENERAL LEDGER - \$ 2,500 ACCOUNTS PAYABLE - \$ 2,500 PAYROLL - \$ 3,500 <p>These fully interactive systems are field proven. Written in DBOL, for execution under DEC's CTS300 or CTS500 operating systems. Source is provided. On-site training and on-going support available, anywhere! Maintenance is via remote diagnostics. Documentation is available for examination — at a charge.</p> <p>REMOTE BUSINESS SERVICES 9 Bettswood Rd., Norwalk CT 06851 (203) 853-1270</p>	<p>PACKAGES FOR SERVICE BUREAUS USING PDP-11'S AND RSTS/E</p> <p>Specifically designed for timesharing PLYCOM has general accounting applications available for immediate delivery. Already installed at over 20 Service Bureaus, this software is extremely solid and reliable. Menu orientation and excellent documentation make these systems easy to learn and to use. Have your staff work on customer specific projects. Let PLYCOM solve your problems:</p> <ul style="list-style-type: none"> Accounts Payable General Ledger Financial Reporting Accounts Receivable Payroll Fixed Assets <p>PlyCom services, Inc. P.O. Box 160 Plymouth, MI 48163 (219) 935-5121</p>	<p>DRS for 11 & VAX Proven! The ^DBMS/PRODUCTIVITY TOOL</p> <ul style="list-style-type: none"> For DEC 11 and VAX (Native Mode Tool) In Use For 10 Years . . . 140 Sites Installed Technology Leader in Data Base Systems <p>Call For A Free BRIEFING MANUAL</p> <p>A AMERICAN USED SOFTWARE COMPANY P.O. Box 68 Kenmore Station: Boston, MA 02215 (617) 437-7600</p>	<p>1900 Embarcadero Road • Suite 208 • Palo Alto, California 94303</p>
<p>MCBA G/L, A/P, A/R, Payroll, Order Entry in Data General AOS COBOL CMIS Assoc., Inc. 513/861-4191</p>	<p>5280 Stand-Alone Applications Software For IBM Distributed Data System Completely menu driven</p> <ul style="list-style-type: none"> Accounts Receivable Payroll Accounts Payable General Ledger Invoicing Letter Writer <p>Send for sample reports and free copy of 5280 Utilities Manual</p> <p>Contact Mo Yarborough</p> <p>Ziegler & Co., Inc. 1173 Blvd. N.E. Orlando, SC 29115 803/534-3740 Telex U603P430</p>	<p>TI 990 FINANCIAL CONTROL SOFTWARE</p> <ul style="list-style-type: none"> COBOL + Interactive Multi-terminal + Flexible Payables + Receivables General Ledger + Payroll Order Processing Inventory Control <p>Great Lakes Information System, LTD. 5 Research Drive, Ann Arbor, MI 48103 (313) 663-6402</p>	<p>If You Are An</p> <p>NCR PROOF USER Using The Magnetic Captures</p> <p>E MDC - MRC - DDPS You Need Our Interface To Your</p> <p>I NCR - IBM - BUR Financial System</p> <p>A CH - MANY OTHER FINE SOFTWARE PRODUCTS.</p> <p>F RUGALNET INC. Software With A Purpose P.O. Box 1674 Bowling Green, Ky. 42101 (502) 781-9755</p>	<p>NEW FOR SYSTEM/34</p> <p>GENERATE ON-LINE F/M PROGRAMS — ON-LINE ADD/CHG/DEL/INQ 58 FIELDS, REPORT OUTPUT</p> <p>S/34 DOCUMENTATION AND ANALYSIS AID SYSTEM</p> <p>OTHER SYSTEMS FOR S/3 AND S/4 — A/P, G/L, A/R, P/R, OTHER (EXTENSIVE DOCUMENTATION, RPG II SOURCE PROVIDED)</p> <p>BANCROFT COMPUTER SYSTEMS, INC. P.O. Box 1533 West Monroe, Louisiana 71291 (318) 388-2236</p>
<p>ELEGANT SOFTWARE For IBM S/34 Computers</p> <ul style="list-style-type: none"> Order Processing Inventory Management General Ledger Accounts Payable Accounts Receivable Mailing Lists Payroll Personnel Oil and Gas <p>All systems are:</p> <ul style="list-style-type: none"> Interactive Flexible Easy to Install <p>J.D. Edwards & COMPANY Architects and Builders of Information Systems Two Denver Technological Center Englewood, Colorado 80111 (303) 773-3732</p>	<p>DATAPoint SOFTWARE</p> <ul style="list-style-type: none"> General Ledger Accounts Payable Accts. Receivable Sales Analysis Purchase Analysis Personnel Payroll Job Costing w/BOM Country Club Acctg Membership & Mailing Complete Databus Source No Royalty Payments 1500, 1800, 5500, 6600 and ARC compatibility Demonstrations available. <p>Call or write</p> <p>MINI-COMPUTER SUPPORT GROUP, INC. 3645 WARRENVILLE CENTER ROAD SHAKER HEIGHTS, OHIO 44122 216-283-2000</p>			

software for sale

software for sale

time & services

- RPG/RPG II to COBOL
- COBOL to COBOL
- FORTAN to FORTAN
- NEAT/3 to COBOL
- DIBOL to COBOL

Converting is easy with



- Proven software
 - Experienced personnel
 - Nationwide offices
- CHECK WITH US TODAY**

DASD Corporation
Corporate Services Center
Dept. 130/9045 North Deerwood Dr.
Milwaukee, WI 53223
(414) 355-3405

DATAPoint USERS BUSINESS SOFTWARE

- Accounts Receivable
- Accounts Payable
- Payroll
- General Ledger
- Inventory
- Time Accounting

For Information, Call:

Custom Computing, Inc.
P.O. Box 1374
Kilgore, TX 75662
214-984-0639

IBM 5120

COMPLETE ACCOUNTING AND MANUFACTURING SYSTEMS

\$950-\$2450

SUPERIOR SOFTWARE

11 W. 2nd St.
Jamesstown, N.Y. 14701
Toll free: (800) 828-9106
In N.Y.S.: (716) 664-3843

MEMORY REPAIRS

ALL MANUFACTURERS DEC, NOVA, OR ANY OTHER

- 10 Day Turnaround.
- 90 Day Warranty.
- Core or Semi. Stack Repairs.
- Reasonable Prices (From \$90).
- Low Flat Fees Available for Dems, Large Users and Repair Lots. 100% Burn-in.

DIGITAL DATA SYSTEMS,

198 N.W. 85 Terr. Plantation, FL 33313
Florida (305) 792-3290
Boston (617) 491-3859
Chicago (312) 475-4435
Philadelphia (215) 277-7442

OUR 8TH YEAR OF SERVICE

BROKERS OF COMPUTER TIME

On-site time: N.Y. metro area only
Timesharing & RJE: Nationwide

Computer Resources, Inc.
(212) 599-0770
(201) 676-1881

SOFTWARE WANTED

Request for Proposal Payroll/Personnel System

The Ohio Turnpike Commission has prepared a technical specification for the replacement of its computerized payroll system. The replacement system should be a payroll/personnel system capable of running on a DEC PDP 11/70 computer system under the RSTS/E operating system.

Vendors interested in obtaining a "Request for Proposal" should contact:

Craig Rudolph, Comptroller
Ohio Turnpike Commission
882 Prospect St.
Berkeley, Ohio 44017
216/234-3081

SOFTWARE WANTED

New England Municipal Hospital looking for tested and proven patient accounting system including billing and accounts receivable. Must run under RSTS-E operating system on DEC PDP 11/70. Documentation and training of small in house staff is required. Reply:

CW Box 2484
375 Cochituate Rd., Rte. 30
Framingham, Mass. 01701

CURTIS WHITNEY Computer Services

370/158-3

VS1-CMS-ROSCOE-DOS

REMOTE JOB ENTRY
INTERACTIVE COMPUTING
TURNKEY SYSTEMS

DATAPoint PROGRAMMING

CONTACT JOE BARRETT

(201) 777-2454

15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD-RIDGE, N.J. 07075

COMPUTER CENTER SHARING MID MANHATTAN

Progressive firm seeks to share computer space to house its computer system and operation. Respond General Mgr.-Operations.

CW Box 2489
375 Cochituate Rd., Rte. 30
Framingham, MA 01701

TIME & SERVICES

MEMORY & COMPUTER REPAIRS

ANY MANUFACTURER'S
MEMORIES
CORE — SEMI
DEC® — DATA GENERAL
COMPLETE CPU'S AND
MEMORIES



THREE DELTA CORP
1038 Kiel Court, Sunnyvale, CA 94086
(408) 734-2680
TWX-910 339-9511

DEC PDP-8 and 11 DIBOL SOFTWARE SERVICES

609-890-0061

PSI
P.O. Box 3600
Trenton, N.J. 08629

TIMESHARING SAVE 50% AND MORE ON CMS, TSO, ETC

As computer time brokers, we offer reliable timesharing services at rates far below those of national timesharing firms.

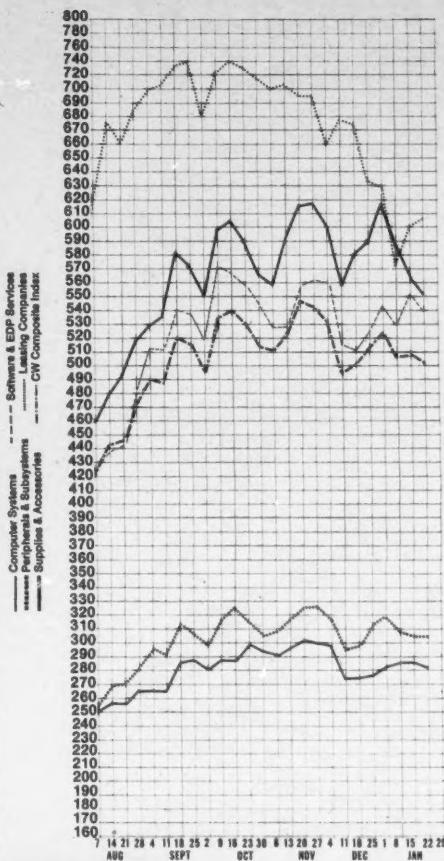
Computer Resources, Inc.
(212) 599-0770
(201) 676-1881

ADVERTISERS' INDEX

ACPI, Ltd.	72
Allen Services	58/9
American Airlines Freight Systems	68
American Key Data	46
American Telephone & Telegraph	20/21
American Terminal Leasing	74
American Used Computer	12
Ampex Memory	SR/32
Applications Software, Inc.	66
Applied Data Research	3,50
Applied Software	SR/28
Arkay Computer Inc.	77
Atlas Energy Systems	91
Authorized Terminal Distributor	81
BDS Computer Corp.	24
John Beall	79
Braegor Corp.	72
M. Bryce & Associates	SR/20
Lloyd Bush & Associates	SR/11
CapeX Corp.	7
Cartefax	10
Circle/Manufacturing Systems Div.	SR/12
Coastal Data Products	76
ComData Corp.	73
CompEd	23
CompuMart Corp.	11
Computer Associates	5
Computer Corp.	11
Computer Corporation of America	58/8
Computer Covenant	10
Computer Engineering Specialists	90
Computer Maintenance & Leasing	68
Computer Research	10
Construction Specialties, Inc.	87
Corporate Computer Systems	16
Cullinane Corp.	SR/23
CW International	SR/29
Cyborg Systems, Inc.	SR/21
Data Access Systems	85
Datalease	43, 65
Datapro Research Corp.	21
Data Systems Services	17
Datacom	25
Decision Data Corp.	14-15
Deltatek	89
Digilog	18
Digital Equipment Corp./ppm/pnm	62-63
Digital Equipment Corp./Terminals	26-27
Digital Research	SR/10
Dorlon Products	8
Durango	70
EDP Auditors & Assoc.	18
Dave Ellis	86
Execucom Systems Corp.	69
Federal Communications Corp.	76
Financial Systems & Software	87
Finair Systems	71
Formation	SR/18
Gennady International	SR/19
Harris Data	SR/14
Hewlett-Packard	36-37, 54-55, 77
Honeywell Information Systems	53, 65
House of Schiller	13
Houston Instruments	88
IBM/DPD	42
ICCI	12
Information & Systems Research	SR/15
Innovation Data Processing	9
Instor Corp.	86
Interactive Management Systems	SR/26
Intel Corp.	SR/4-SR/5
J & G Industries, Inc.	24
B.J. Johnson & Assoc.	71
Kern Publishing	SR/20
KV Control Systems, Inc.	91
Lear Siegler, Inc.	39, 40-41
Leasing Consultants, Inc.	SR/20
Local Data	11
3M Company	46
2M Corporation	12, 13
Mann-Davis Inc.	SR/14
Mannsman Tally	32
McCormack & Dodge	132
McGraw-Hill Book Co.	75
MicroAge Computer Stores Inc.	35
Minicomputer Business Applications	SR/24
Mitron	6
Modern Software Design	23
Mohawk Data Sciences	38
Mostek	33
MPL	14
MTI, Inc.	74
Myriade Data Systems Ltd.	SR/6
National Advanced Systems	22
National Information Systems	70
NCA	8
NCR Corp.	45
Newtron Computer	10
NYC, Inc.	76
Oregon Software	SR/14
Perkin-Elmer Corp.	58-59, 82
Personnel Data Systems	SR/13
Prime Computer	SR/16-SR/17
Qwestronics	4
Qwikteam	6
Ramtel	45
Raytheon Data Systems Co.	47
SDA	56, 57
Software AG	29
Software International	SR/30, 86
Software Module Marketing	SR/25
Storage Technology Corp.	19
Superior Software	SR/21
Tandem Computers	30-31
Technology Transfer Institute	30
Tel Com Products Inc.	32
Televideo Inc.	43
Texas Instruments	64
Timberline	84
Tone Software Corp.	SR/28
TransCapital Computer Corp.	90
Transcom	SR/28
United Peripheral	34-35
Unisys Corp.	SR/18
Universal Software	67
Verhoed Information Packages, Inc.	49
Wang Labs	52
Wolfe Computer Aptitude Testing	15
Youdron	28, 78
Zenith Data Systems	44

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CW COMMUNICATIONS/INC.

Board Chairman/Publisher

Patrick J. McGovern

President

W. Walter Boyd

VP-Research Jack Edmonston

VP-Marketing Roy Einreinhofer

VP-Editorial E. Drake Lundell, Jr.

VP-Finance William P. Murphy

VP-Circulation Margaret Phelan

VP-Production Lee Vidmer

Computerworld Headquarters
375 Cochituate Road, Box 880
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

SALES

Vice President Roy Einreinhofer

Display Adv Mgr Frank Collins

Display Adv Melinda Walker

Jonna Yager

Jenny Charlesworth

Classified Adv Mgr William J. Mills

MARKETING SERVICES

Vice President Jack Edmonston

Director Research Kathryn Dinneen

Sales Promotion Peter Segal

CIRCULATION

Vice-President Margaret Phelan

Circulation Mgr Barbara Jeannetti

Service Rep Peggy Kelly

Assistant Carmela Priante

PRODUCTION

Vice-President Lee Vidmer

Production Mgr Peter Holm

Supervisor Henry Fling

Typesetting Mgr Tom Pfau

Computerworld Sales Offices

Roy Einreinhofer
Vice-President/Marketing
Frank Collins
Manager, Display Advertising
William J. Mills
Manager, Classified Advertising
Diana La Muraglia
Manager, International Marketing
Services
COMPUTERWORLD
375 Cochituate Road
Box 880
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

BOSTON
Robert L. Ziegel
Northern Regional Director
Cochituate
Edward P. Marecki
District Managers
Kathy Doyle
Susan Wolfe
Account Coordinators
COMPUTERWORLD
375 Cochituate Road
Box 880
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

NEW YORK
Donald E. Fagan
Eastern Regional Director
Peter Senn
Michael Masters
District Managers
Candy Kelly
Account Executive
COMPUTERWORLD
Paramus Plaza I
140 Route 17 North
Paramus, N.J. 07652
Phone: (201) 967-1350

CHICAGO
Dave Dolber
District Manager
Jan Heaney
Account Coordinator
COMPUTERWORLD
2600 South River Road
Suite 304
Des Plaines, Ill. 60018
(312) 827-4433

LOS ANGELES
Jim Richardson
District Manager
Bob Howard
Account Manager
Kathie Knox
Account Coordinator
COMPUTERWORLD
3420 Ocean Park Boulevard
Suite 3020
Santa Monica, Calif. 90405
Phone: (213) 450-7181

SAN FRANCISCO
William J. Healey
Western Regional Director
Barry G. Malone
Bob Sartor
Account Managers
Ruth Gordon
Account Coordinator
COMPUTERWORLD
353 Sacramento Street
Suite 600
San Francisco, Calif. 94111
Phone: (415) 421-7330

JAPAN
Mr. Shigemura Takahashi
General Manager
DEMPA-COMPUTERWORLD
1-11-15 Higashimurayama
Shinagawa-ku, Tokyo 141
Phone: (03) 455-6101
Telex: J2424481

UNITED KINGDOM
Steve Burton
IDG PUBLISHING LTD.
140 Clerkenwell Road
London EC1
Phone: (01) 837-1222
Telex: UK-269477

Euan C. Rose
BEER'S HOBSON & ASSOCIATES
34 Wiltshire Kennet
Warwickshire CV8 1HE
Phone: (0926) 57619
Telex: UK-311951

WEST GERMANY
Eckhard Upadel
CW PUBLIKATIONEN
Postfach 10 15 10
8000 Munich 40
Phone: (089) 34-90-61
Telex: W.Ger-5-215250-HKF

AUSTRALIA
Alan Power
COMPUTERWORLD PTY. LTD.
37-43 Alexander Street
Crow Nest, NSW 2065
Phone: (02) 439-5133
Telex: SECCO AA25468

BRAZIL
Erico Guerreiro
COMPUTERWORLD do BRAZIL
Servicos e Publicacoes Ltda.
Rua Alcindo Guanabara
25/10th floor
20031 Rio de Janeiro, RJ
Phone: (021) 240-8225
Telex: 11-32017 (WORD BR)

MEXICO
Kevin Keleghan
COMPUTERWORLD de MEXICO
Oaxaca 21-2
Colonia Roma
Mexico City 7 D.F.
Phone: (905) 514-4218
(905) 514-6309

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 21, 1981

All statistics compiled,
computed and formatted
by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

EXCH	PRICE				EXCH	PRICE				EXCH	PRICE			
	1980-81 RANGE (1)	CLOSE JAN 21 1981	WEEK CHNGE	WEEK PCT		1980-81 RANGE (1)	CLOSE JAN 21 1981	WEEK CHNGE	WEEK PCT		1980-81 RANGE (1)	CLOSE JAN 21 1981	WEEK CHNGE	WEEK PCT
COMPUTER SYSTEMS														
A ANDAHOL CORP	15- 42	28	+ 1/8	+0.4	D ADVANCED COMP TECH	1- 8	5	- 5/8	-11.1	A DATA ACCESS SYSTEMS	8- 23	18 7/8	- 1/4	-8.2
N BURROUGHS CORP	47- 125	100	+ 3/8	+0.7	D ADVANCED SYSTEMS INC	12- 15	10 1/2	+ 3/4	+2.8	D ADAPTRONICS CORP	11- 38	32	+ 1/4	+0.7
D COMPUTER AUTOMATION	27- 92	15	- 1/2	-8.0	D ANACOMP INC	7- 24	18 1/4	+ 1/4	+1.3	D DATUM INC	2- 5	3 5/8	- 1/4	-6.4
N CONTROL DATA CORP	35- 77	85 1/4	- 1/8	-1.6	D ANALYSTS INT'L CORP	3- 14	18 1/2	- 1	-10.5	D DECISION DATA COMPUT	2- 6	4 3/8	- 1/2	-10.2
N CRAY RESEARCH INC	10- 49	38 7/8	+ 2 3/4	+7.4	D APPLIED DATA RES.	8- 24	18 1/8	+ 1/4	+7.4	D DELTA DATA SYSTEMS	1- 3	1 7/8	+ 1/4	+15.3
N DATA GENERAL CORP	46- 87	52	- 3/8	-0.7	D AUTOMATIC DATA PROC	31- 52	47	- 2	-4.0	D DATARAM CORP	8- 37	10 1/4	- 5/8	-5.7
N DATAPoint CORP	44-119	100 1/2	- 7	-6.5	D CO. COMPUTER ASSOC	8- 17	13 1/4	- 1/2	-10.1	D ELECTRONIC M & M	3- 9	8 5/8	- 1/8	-1.8
N DIGITAL EQUIPMENT	52- 88	84 5/8	+ 3/8	+0.8	D COMPUTER MFG. INC.	1- 5	2 1/4	- 1/4	-8.0	D EVERETT & SUTHERLAND	21- 83	62 1/2	- 2	-3.1
N ERICSSON INC	10- 49	50	+ 1/4	+0.2	D COMPUTER MFG. INC.	4- 8	1 1/4	- 1/4	-2.5	D FABRICATORS INC	1- 4	2 5/4	+ 1/8	+4.7
N ELECTRONIC ASSOC.	8- 62	7 1/2	+ 3/8	+5.2	D COMPUTER SCIENCES	11- 30	1 1/2	- 1/4	-1.1	D GEN'RL COMPUTER SYS	1- 8	8 1/2	+ 2	+30.8
N FOUR-PHASE SYSTEMS	20- 48	22 1/8	- 1/3	-5.8	D COMPUTER USAGE	1- 23	18 1/2	- 1/2	-7.1	D GEN'L DATA COMM IND	8- 22	17 1/2	+ 1/4	+1.4
N FOXBORO	31- 51	51	- 1/2	-2.8	D COMPUTER TASK GROUP	2- 10	8 1/4	+ 1/4	+3.1	D GENERAL TERMINAL CP	1- 4	1 5/8	- 1/8	-7.1
O GENERAL AUTOMATION	7- 18	8 7/8	- 1/8	-1.3	D COMPUT AUTO REP SVC	4- 11	7 1/2	- 1/8	-1.8	D HAZELTINE CORP	12- 33	24 1/8	- 1/4	-8.7
O GTE COMPUTER CORP	1- 3	1 1/2	0	0.0	D CULLINANE DATABASES	11- 21	14 1/2	- 1/4	-7.4	D HARRIS CORP	20- 59	50 1/8	+ 3/8	+0.7
O HEMELWELL-PACKARD CO	46- 99	79 1/4	- 5	-5.2	D DATA DIMENSIONS INC	1- 6	1 3/8	0	0.0	D INTEL CORP	18- 51	15 1/2	+ 1/4	+2.5
O HONEYWELL INC	63-115	101 1/8	- 2 5/8	-2.5	D DATABASE	1- 4	1 1/8	0	0.0	D INTERSIL	13- 34	34 1/2	+ 3/8	+1.1
N IBM	50- 78	85 1/8	- 2 5/8	-2.4	D DBI CORP	4- 9	8 1/2	0	0.0	D LUNDY ELECTRONICS	4- 17	11 1/8	- 1/8	-1.1
O MAGNUSON COMP SYSTS	20- 46	37	- 3 1/4	-8.0	D ELECTRONIC DATA SYST	18- 38	38 1/4	- 2	-5.2	D MSI DATA CORP	5- 18	13 1/8	- 5/8	-4.5
O MANAGEMENT ASSIST	8- 25	14	- 1 1/4	-8.1	D INFORMATICS INC	8- 25	23	+ 1 5/8	+7.8	D NERDEX	10- 34	10 3/4	- 1	-8.5
O MANUFACTURING DATA S	22- 80	70	- 1	-1.4	D INSITE CORP	1- 3	3 1/8	+ 3/4	+31.5	D NORMANDY DATA SCI	10- 31	22	- 1/8	-0.3
O MINI-COMPUTER SYST	2- 8	1 7/8	0	0.0	D IPC COMPUTER MARKET.	1- 4	1	0	0.0	D OHESI	2- 12	10	0	0.0
O MODULAR COMPUTER SY	8- 31	18	0	0.0	D KEAN ASSOCIATES	3- 8	5 3/4	- 1/4	-4.1	D PARADYNE CORP	9- 34	34	+ 4 1/2	+15.2
N NCR	52- 82	63 5/8	- 4 5/8	-6.7	D KEYDATA CORP	1- 5	1 1/8	- 1/8	-8.5	D PENRIL CORP	8- 18	13 1/8	- 1/8	-7.8
N PRIME COMPUTER INC	10- 41	34 3/8	- 1	-2.8	D LOGICON	12- 30	28 1/8	- 1/4	-8.2	D RANTEK CORP	10- 23	19 1/2	- 1/4	-1.3
N PERKIN-ELMER	13- 35	25 3/8	- 1 1/2	-4.8	D MATHEMATICA INC	5- 18	13 3/4	- 1/4	-8.3	D RECORDATION EQUIP	5- 21	19 7/8	0	0.0
N SPERRY	4- 48	58	- 3	-6.0	D MATHEMATICAL APP DRP	7- 23	18 1/4	- 1/4	-8.0	D RETEK DATA	1- 3	3	- 1	-2.0
N TANDY COMPUTERS INC	13- 24	24 1/2	- 1/2	-0.7	D NATIONAL DATA CORP	10- 38	35 1/8	+ 5/8	+1.8	D STORAGE TECHNOLOGY	12- 28	20 1/8	- 3/4	-3.5
N TEXAS INSTRUMENTS	78-150	113 3/4	- 3	-2.5	D NATIONAL PLANNING	5- 13	7 1/4	- 1/4	-12.1	D SYKES DATATRONICS	14- 50	35	- 1	-2.7
A WANG LABS.	17- 60	35 1/2	+ 3/4	+2.1	D REYNOLDS & REYNOLD	20- 34	21	- 1/2	-1.2	D T-BAR INC	14- 24	18 1/4	- 1/2	-7.5
LEASING COMPANIES														
O BOOTHE FINANCIAL CP	13- 27	18 3/4	- 3/4	-3.6	D SCIENTIFIC COMPUTERS	3- 17	12 3/4	- 1/4	-8.8	D TEC INC	3- 8	5 3/4	+ 1/8	+2.3
N COMDISCO INFO SYS	18- 24	18 3/8	- 1 1/8	-5.7	D THERMEX INC	17- 50	43 3/4	+ 3/8	+3.2	D TELEKOM INC	42- 70	55 1/8	- 1/4	-5.1
A COMMERCE GROUP CORP	1- 2	7/8	0	0.0	D THERMEX & NEW	5- 17	14 1/4	- 1/8	-0.8	D TELEX	3- 9	5 3/8	- 1/4	-7.8
A COMPUTER INSTRUS GRP	0- 4	1/4	0	0.0	N HYLY CORP	4- 20	13 3/4	- 7/8	-5.8	D TESDATA SYSTEMS CP	8- 28	10 5/8	- 7/8	-7.8
O CONTINENTAL INFO SYS	2- 15	4	0	0.0	N AM INTERNATIONAL	13- 24	13 3/4	+ 1/8	+0.8	D TIMEPLEX INC	5- 22	14	+ 5/8	+4.8
N DATICR RENTAL	3- 5	3 1/2	0	0.0	N AMERICAN BUS PRODS	8- 15	13 3/4	- 1/8	-0.8	D WALLACE BUS FORMS	1- 3	5/8	- 1/2	-4.5
N DTEL INC	1- 15	3/8	0	0.0	N ANDERSON JACOBSON	8- 25	21 1/4	+ 1 3/8	+6.8	D BALTIMORE BUS FORMS	1- 2	1/2	0	0.0
N LEASPAC CORP	1- 2	5/8	0	0.0	N AUTO-TRON TECHNOLOGY	18- 62	36 1/2	- 2 1/2	-6.2	D BARRY WRIGHT	8- 22	18	- 5/8	-3.3
A PIONEER TEX CORP	2- 4	3 5/8	+ 5/8	+20.8	N BEEMER INVL	3- 9	36 1/4	+ 2	+7.0	D CYBERMATICS INC	1- 2	2	- 1/2	0.0
N RELIANCE GROUP INC	24- 78	68 1/2	+ 1 1/2	+2.2	N BUNKER RAMO	17- 41	39 3/4	+ 2 1/4	+6.0	D EMULEX PRODUCTS INC	11- 21	13 5/8	+ 1/4	+1.8
N U.S. LEASING	12- 28	25 7/8	- 1/8	-0.4	N CAMBRIDGE MEMORIES	1- 8	2 5/8	- 1/4	-8.8	N EMULEX BUS FORMS	13- 21	18	- 1/4	-1.5
PERIPHERALS & SUBSYSTEMS														
N AMERICAN BUS PRODS	8- 15	13 3/4	- 1/8	-0.8	N CENTRONICS DATA COMP	19- 55	20 1/4	- 1 5/8	-7.4	N 3M COMPANY	48- 83	58 3/8	- 2 3/4	-4.4
N BALTIMORE BUS FORMS	1- 2	1/2	0	0.0	N COGETRONICS	1- 10	8	+ 1/8	+3.2	D BARRY WRIGHT	27- 37	33 5/8	- 1/2	-1.4
N BALKIN	0- 2	1/2	0	0.0	N COMPUTER CONSOLES	4- 29	21	- 1 1/4	-5.6	D CYBERMATICS INC	20- 35	28 1/8	+ 1/2	+8.0
N BARTON	0- 2	1/2	0	0.0	N COMPUTER TRANSCEIVER	1- 6	5 1/4	0	0.0	D EMULEX PRODUCTS INC	22- 35	31 3/4	- 2 1/2	-7.2
N BURKE	0- 2	1/2	0	0.0	N COMPUTERVISION CORP	13- 25	18 3/4	+ 1/2	+2.7	D STARBOARD REGISTER	9- 20	30 3/4	+ 1/4	+1.2
N CONNAC CORP	0- 2	1/2	0	0.0	N CONRAD	0- 2	0	0	0.0	D TAB PRODUCTS CO	9- 20	30 3/4	+ 1/4	+4.4
N DELL	0- 2	1/2	0	0.0	N COMPUTERVISION CORP	24- 82	71 1/2	+ 2 1/4	+3.2	D MABASH MAGNETICS	11- 31	30 1/4	+ 1/4	+4.4
N DELL	0- 2	1/2	0	0.0	N CONNAC CORP	13- 25	18 3/4	+ 1/2	+2.7	D WALLACE BUS FORMS	12- 28	24	- 1 1/2	-5.8

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-NASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
D-T=PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Financial software so advanced that Encyclopaedia Britannica wants to keep it a secret.

Encyclopaedia Britannica. And over 1,000 other companies that benefit from McCormack & Dodge financial software.

When you're ahead of the pack, the less said the better.

Suffice it to say that Britannica's General Ledger package is unparalleled in its fast, flexible reporting, its efficient journal processing, its comprehensive editing and extended capacity for budget control.

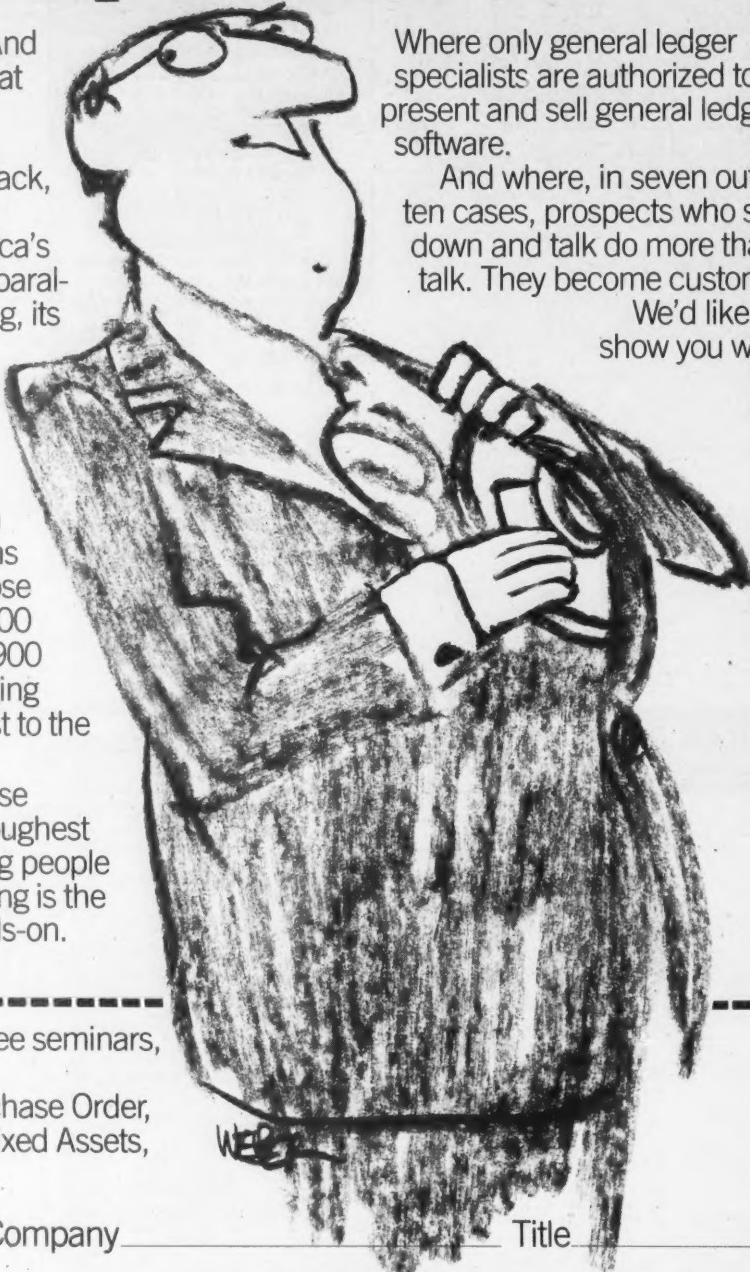
Behind the package is a software company with proven success in the highest echelons of the publishing industry. Whose client list includes more than 100 of the *Fortune* 500. Plus over 900 other leading companies, ranging from the oldest and the biggest to the youngest and fastest growing.

McCormack & Dodge. Whose customers are the smartest, toughest controllers and data processing people in the world. Where user training is the way training ought to be: hands-on.

Where only general ledger specialists are authorized to present and sell general ledger software.

And where, in seven out of ten cases, prospects who sit down and talk do more than just talk. They become customers.

We'd like to show you why.



Please send schedule of free seminars, plus information on:

- General Ledger, Purchase Order,
- Accounts Payable, Fixed Assets,
- Capital Project Analysis

Name _____ Company _____

Title _____

Address _____

City _____

State _____ Zip _____ Phone _____

Computer Model _____

McCormack & Dodge

The best financial software. The best financial people.

560 Hillside Avenue, Needham Heights, MA 02194, (617) 449-4012

Atlanta (404) 997-2797, Chicago (312) 843-3400, Dallas (214) 369-7014, Los Angeles (213) 645-6382, Washington, D.C. (703) 734-0710,
New York/New Jersey (201) 528-6331, Toronto (416) 445-2971. United Kingdom/Netherlands • Italy • Australia/New Zealand • Mexico • South Africa • Sweden

